AVIATION AND AIRCRAFT JOURNAL

DECEMBER 5, 1921 VOL. XI. NO. 23

Member of the Audit Bureau of Circulations

INDEX TO CONTENTS

Editorials	651	Admiral Sims on Aviation	659
Means for Improving Airplane Performance	652	"Who's Who in American Aeronautics"	660
The French Anti-Aircraft Service	655	First Demonstration of the Alula Wing	662
Spain to Argentine Airship Service	656	French Aircraft Engine Competition	662
State Aeronautical Legislation	658	Aviation Policy of the American Legion	663
A Message from Gabriele D'Annunzio	658	Foreign Aeronautical News	664

THE GARDNER, MOFFAT COMPANY, Inc., *Publishers*

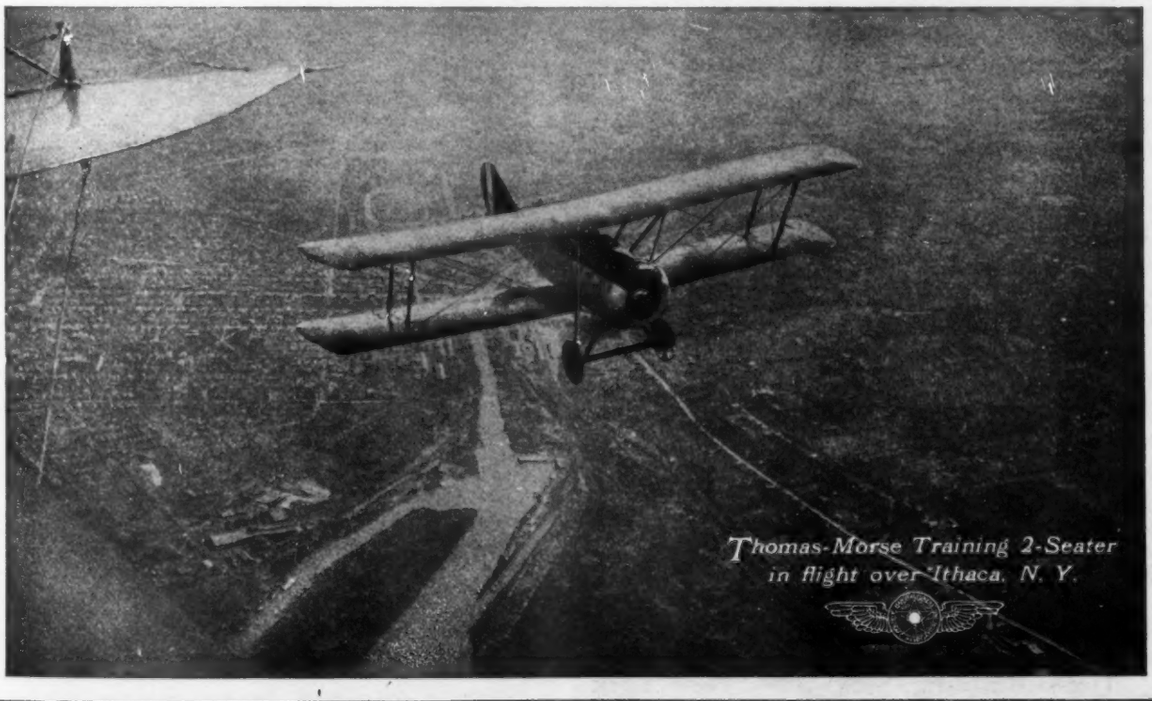
HIGHLAND, N. Y.

225 FOURTH AVENUE, NEW YORK

SUBSCRIPTION PRICE: FOUR DOLLARS PER YEAR. SINGLE COPIES FIFTEEN CENTS. CANADA, FIVE DOLLARS. FOREIGN, SIX DOLLARS A YEAR.

COPYRIGHT 1921, BY THE GARDNER, MOFFAT COMPANY, INC.
ISSUED EVERY MONDAY. FORMS CLOSE TEN DAYS PREVIOUSLY. ENTERED AS SECOND-CLASS MATTER NOV. 22, 1920, AT THE POST OFFICE AT HIGHLAND, N. Y., UNDER ACT OF MARCH 3, 1897.

THOMAS-MORSE AIRCRAFT CORPORATION



Thomas-Morse Training 2-Seater in flight over Ithaca, N. Y.

THOMAS-MORSE AIRCRAFT CORPORATION

New York Tribune

First to Last—the Truth: News, Editorials—Advertisements

Member of the Audit Bureau of Circulations.

WEDNESDAY, NOVEMBER 23, 1921

Owned by New York Tribune Inc., a New York Corporation. Published daily. Ogden Reid, President; G. Vernor Rogers, Vice-President; Helen Rogers Reid, Secretary; R. E. Maxfield, Treasurer. Address, Tribune Building, 154 Nassau Street, New York. Telephone, Beekman 3000.

SUBSCRIPTION RATES — By mail, including Postage. IN THE UNITED STATES:

By Mail, Postpaid.	One Year	Six Months	One Month
Daily and Sunday	$12.00	$6.00	$1.00
One week, 30c.			
Daily only	10.00	5.00	.85
One week, 25c.			
Sunday only	4.00	2.25	.40
Sunday only, Canada	6.00	3.25	.55

FOREIGN RATES

Daily and Sunday	$26.00	$13.30	$2.60
Daily only	17.40	8.70	1.45
Sunday only	9.75	5.12	.85

Entered at the Postoffice at New York as Second Class Mail Matter.

GUARANTY

You can purchase merchandise advertised in THE TRIBUNE with absolute safety—for if dissatisfaction results in any case THE TRIBUNE guarantees to pay your money back upon request. No red tape. No quibbling. We make good promptly if the advertiser does not.

MEMBER OF THE ASSOCIATED PRESS

The Associated Press is exclusively entitled to the use for republication of all news credited to it or not otherwise credited in this paper, and also the local news published herein.

All rights of republication of special matter herein also are reserved.

Until now he was lacking. By this time the good Uncle Sam has so many fleas in his fur that he is in danger of being eaten alive."

Such utterances, there is reason to believe, are approved by only a small fraction of the men and women of German birth or extraction in this country. They come from an insignificant minority of stupid "die hards" or from professional agitators financially interested in keeping hatreds and animosities alive.

But inevitably their words are quoted and accepted as voices of the opinion of millions who thus become victims of their prejudices. Why do they not fail to suppress their malignant traducers. Obviously such publications as the "Volks Presse," with their coarse and vulgar abuse of foes to all German names.

The Root Program

The Root proposals for the protection of China, accepted by the conference, reaffirm the essentials of this country's Chinese policy. The United States has never sought ter-

ises well for the youth of the city. The admirable record of the K. of C. chapter at home and with the A. E. F. is an earnest of success. The project calls for $2,000,000, of which $1,000,000 has already been pledged by the Knights themselves.

America's Commercial Aviation

The first annual report on commercial aviation, just made public by the Navy Department, while covering only the operations of one company clearly shows that commercial aerial transport in this country does not suffer by comparison with the activities of European air lines. In fact, it shows that in the matter of safety America leads Europe.

Americans returning from Europe have brought glowing reports concerning air travel there, and the cables have been kept busy transmitting detailed descriptions of the services maintained on the Continent, all to the apparent detriment of American endeavor. In fact, it has been broadly intimated that commercial aviation here had been sadly and reverently laid in a premature grave.

Now we find in the report received by Rear Admiral Moffett, head of the new bureau of aeronautics of the Navy Department, that American civil air transport, far from being extinct, has established a record for itself which even the brilliant performances of European air lines cannot equal.

The first company reporting to the Navy Department is the Aeromarine Airways, and the report shows that during the last year no fewer than 6,814 passengers were carried a distance of 95,020 miles without a single accident or mishap. In addition to this the flying boats operated by this service transported 29,002 pounds of mail and freight.

Included in these operations is the remarkable 'cross-country flight of the Santa Maria, one of the big United States Navy air cruisers converted into an eleven-passenger cabin airplane. This flying boat made a complete circumnavigation of the eastern half of the United States. Starting from Key West, Fla., it flew up the Atlantic seaboard to this city, and then began a 'cross-country flight over the inland waterways, along the Hudson River Valley and Lakes George and Champlain to Montreal, thence over the Great Lakes to Chicago. From the latter city it flew over the Illinois and Mississippi River valleys to New Orleans, a total air distance of seven thousand miles.

If American aerial transport companies can in the coming year maintain this remarkable performance with an equal degree of safety the threatened and feared European commercial air invasion will never materialize.

COMMERCIAL AVIATION PROVEN

We of the AEROMARINE organization are proud of the fact that the pioneer effort put forth during the past year in flying boat transportation has caused this authoritative editorial statement to be published in one of the leading Metropolitan daily newspapers.

Aeromarine Flying Boats are demonstrating daily the *safety* and profit of flying boat transportation—The Aeromarine Navy Flying Boats are the only type used by Aeromarine Airways. We have a limited number for sale and are accepting orders for spring delivery.

Write for catalog and dealers proposition.

Aeromarine
Reg. U. S. Pat. Off.

Engineering & Sales Co.

Times Building New York

"BE SURE IT'S AN AEROMARINE"

called Napoleon III foist Maximilian, an A duke, upon the thron America, beware!

It is by the abount over two million Frenc dead now moldering ust that Mr. Wells i his echoes of Will t English tongue, i d German. He s "A Outline of Ingrat

A Holiday fo

Now that Senator Ohio, and Senator K have obtained all the p is to be had out of th day resolutions, let until the President an call upon them for as two gentlemen migh chosen some other mea the folks back home th Washington.

Mr. Pomerene and the simplest of telepl addressed to the Navy could have learned that necessity for their resol tically all of the 192 appropriation has be Work has ceased on s on others it is being c reduced pace.

It is to be hoped th Affairs Committee will lutions die a proper death. The committee ety might suggest to h men from Ohio and U go on a holiday until t has adjourned.

A Tribune R

Who Has Always Lik and Writes to

To the Editor of The Tr

Sir: You will probabl ter odd, for it is one o and yet the writer ho more like it are sent to

Years ago, it seems, I and there learned somet gineering, things litera things not mentioned in t One of these was learni appreciate The Tribune. began the initiation into for me, which continued war. We both liked it qualities, even though I the Hughes-Wilson epis

Together we often rea both enlisted on reading into the big show. I st went over, and remaine yet in his letters he e the pleasure it gave hi when he found a Tribune wear, but still The Tribu

To-day, a Philadelphi awoke from the sleep of read, from force of habi newspaper. Rarely have thing like it. Devoid of news or Le Vrai à la H adequately express the ure it gave the reader.

L. D. GARDNER, PRESIDENT
W. D. MOFFAT, VICE-PRESIDENT
W. I. SEAMAN, TREASURER
GEORGE NEWBOLD, BUSINESS MANAGER

AVIATION AND AIRCRAFT JOURNAL

LADISLAS D'ORCY, EDITOR
ALEXANDER KLEMIN
EDWARD P. WARNER
RALPH H. UPSON, CONTRIBUTING EDITORS

Vol. XI | December 5, 1921 | No. 23

A Europe-South America Airship Service

THE announcement coming from one of the directors of the Zeppelin company that arrangements have been perfected with a view to organizing an airship service between Spain and South America will be of paramount interest to all those concerned with the development of civil air transport by the use of lighter-than-air craft.

Ever since the Armistice stopped the belligerent activities of aircraft numerous plans have been aired with regard to the utilization of airships for the transportation of passengers and express matter. Germany, possessing by far the most exhaustive experience in airship construction and operation, was so much bent on exploiting this technical advantage of hers, that she did not even wait for the signing of the peace treaty before she started to build commercial Zeppelins. The first of these, the Bodensee, was actually put in operation between Berlin and Friedrichshafen, and a sistership, the Nordstern, was to have opened up the Berlin-Stockholm route, when the Allies seized the two ships to make Germany pay in kind for the wilful wrecking of seven naval Zeppelins.

When it became evident to the Germans that the Allied ruling would for some time make it impossible to operate civil airships in, and from, Germany, they approached various quarters with a view to organizing commercial Zeppelin services with foreign participation. While their plans miscarried in Holland and in the United States, they seem to have at last been successful in Spain and in the Argentine, for the projected South American airship line is to be financed by Spanish capital—if the information on hand is reliable.

From the technical point of view the proposed service has much to commend it. While the longest oversea flight it involves, 2000 miles, is equal to the distance between Newfoundland and Ireland, weather conditions on the West African and South American coasts are much more favorable than in the North Atlantic. Gales, fog and low temperature are far less severe on the South American route, and the prevailing winds, the "trade winds", have not only a much lower velocity but also are shallower. If therefore an airship should find a headwind on its route, it might, with little expenditure of static energy, find favoring winds by climbing above the "trades". As against these advantages there is the drawback that the route takes the ship through a wide belt of latitudes with corresponding changes in temperature, although this advantage may be less real in actual operation for temperature changes in those latitudes do not occur with the suddenness characterizing the Northern Atlantic. Another possible drawback to this route is afforded by the yet unknown effect of the high tropical temperatures on airship fabrics. This will undoubtedly lead to special studies of the question, and be perhaps instrumental in the development of new protective coating, if not of special fabrics.

Whether this service will actually stop short in Spain, or whether it will be extended to Paris, and possibly to Berlin, is a matter for speculation. Certainly a Paris to Buenos Aires service enabling the wealthy traveling class of that section to save about eight days out of twelve seems assured of success.

At any rate a Europe to South America airship service appears to us a more truly commercial enterprise than the "Imperial Airship Service" which the British government has for some time been attempting to establish between London, Egypt, India and Australia. On this route the wealthy passenger constitutes an infintesimal proportion of the traveling public as compared to that of the Europe-South America services, and since the airship fares will have to be comparatively high, at least in the beginning, an England to Australia airship line would hardly seem a profitable undertaking.

House Markings for Air Lines

ONE of the most effective means for the prompt recognition of airplanes and seaplanes in flight, at heights where colors can still be distinguished from the ground, consists in painting some distinctive color scheme on the fuselage or on the hull. The first to realize the advertising value of such "house markings" seems to have been the Mercury Aviation Co. of California, whose airplanes are painted black and red. Now the Aeromarine Airways are following suit by standardizing a black tail for their formerly all-white flying boats.

The value of such house markings—which does not yet seem to have been realized in Europe—is not limited to the advertisement it affords to the firm in question, for in its wider application the scheme advertises air transport. The principal reason for the relatively small continued interest the man in the street displays toward aircraft—as distinct from flying in general—is undoubtedly due to his inability to distinguish between the machines that fly. In general, aircraft have an air of anonymity when they do not show the "star-in-the-circle" markings of the Army Air Service and of Naval Aviation, and even the most expert observer is often puzzled on sighting a machine which evidently does not belong to local airports.

A more general adoption of house markings would give aircraft a kind of personality which might greatly increase the interest the general public takes in aerial navigation. Already the Aeromarine "White Fleet", which will now perhaps be nicknamed the "Black Tail Line", is well known along the New York water front. Other commercial firms might get similar recognition from the public were they to adopt house markings.

Means for Improving Airplane Performance

By Harlan D. Fowler, A. E.

Ever since the first successful airplane took to the air, with its live load of one passenger and fuel for a short flight, numerous and various ideas have been suggested to create more efficient means whereby the proportion of this live load may be increased and economically transported.

The only immediate remedy was to decrease the weight of the engine and its fuel consumption. The engine which was used in the first Wright airplane in 1903 was constructed by the Wright brothers and developed 12 hp. and the weight was 152 lb. or 12.7 lb. per hp. By 1919 the average best engine gave 420 hp. and weighed about 840 lb. or 2 lb. per hp. In the same period of time fuel consumption was reduced from 0.80 lb. per hp. hr. in 1903 to 0.50 lb. per hp. hr. in 1919. This great reduction in weight of aircraft engines and their fuel consumption has made possible the partial realization of the economical and efficient airplane, although it must be conceded that aeronautical engineering should be credited for the finely developed airplane structure as it is known today. Further decrease in engine weight and fuel consumption is looked for but the limit has been closely reached on account of the inevitable sacrifice of reliability and long duration as the result of light material and inability to resist wear.

In the attempt to keep pace with the demand for better performance it was necessary to consider the possibility of the aerofoil and the reduction of parasite resistance. The extent to which this reduction in parasite resistance has been carried is apparent in our present designs of wireless cantilever wings and the streamlining of the fuselage and engine.

Development in Aerofoils

It is evident that to obtain any appreciable increase of airplane performance and its carrying ability that the aerofoil offers the most widely undeveloped field of airplane design.

The establishment of aerodynamical laboratories quickly brought about a surprising and far reaching discovery. It has always been assumed that the sustaining power of an aerofoil was derived from the pressure of the air against its under surface, whereas it was found that the upper surface carries about 75 per cent of the load (Fig. 1), and was caused by the vacuum which existed there from the influence of the nose of the aerofoil in the upward deflection of the wind current. The lower surface is only subjected to pressure amounting to 25 per cent of the load. This proportion varies slightly for different angles and individually designed aerofoils. This discovery soon lead to the conception of much more efficient aerofoils.

Wing curvature is a highly scientific development and is the determining factor in the performance of an airplane. An aerofoil for load carrying is unsuitable for high speed, and vice versa. Therefore, we must compromise. It is essential that the landing speed of the airplane be sufficiently slow to permit safe landings. The higher the landing speed the more expert piloting required and the larger the landing field. This landing speed determines the minimum as well as the maximum speed. The lifting capacity of an aerofoil is determined from its aerodynamic characteristics. The general range of the angle of incidence through which lift may be obtained is from minus two degrees to plus sixteen degrees in which the value of the lift coefficient ranges from zero to maximum. The lift coefficient at maximum angle of incidence determines the minimum speed.

Combining High Speed with Large Load

Ordinarily, the landing speed is from 50 m.p.h. to 60 m.p.h., and for speed scouts about 70 m.p.h. Roughly this means that the maximum speed may vary from 110 m.p.h. for load carrying planes to 160 m.p.h. for speed scouts. Airplanes that attain a speed of 200 m.p.h. (which has recently been attained) must land at about 90 m.p.h. Speed indicates high power per load carried. Thus we have engines that weigh about 850 lb. which develop 425 hp. This is a weight of 2 lb. per hp. This type of engine may be placed in a plane carrying a total of either 2125 lb. or 8500 lb., which will give a loading of 5 lb. or 20 lb. per hp., respectively. The more load carried per hp. the lower the maximum speed, because it is like a man carrying a heavy load which compels him to travel slow. It is thus clearly shown that if we desire high speed the load must be small, with high power and small wing area, the latter condition of which will compel a landing speed of a precarious nature. Now, then, can it not be possible to devise something that will permit our airplanes to carry this large load and still obtain this high speed without impairing the safe landing speed? Present attempts seem to indicate that this can be accomplished and it is my endeavor in this article to show how we are trying to bring about this accomplishment.

The Fundamental Formula

The fundamental formula of aerodynamics for sustentation is

$$W = K_y.A.V^2$$

where W = the total load of the airplane
K_y = lift coefficient, expressed in lb. per sq. ft. m.p.h.
A = total area of the wings.
V = velocity of the airplane in m.p.h.

and combined with sufficient power flight will ensue.

W and V being constant values it is evident that K_y and A offer the two avenues which may be varied to obtain a certain condition of performance.

A is the only structural element which can be altered and it was with this that the first attempt of a mechanically controlled airplane wing was made.

The above law has been recognized for many years and various means were considered to alleviate this restriction. These may be divided as follows:

(a) Variable area.
(b) Variable camber.
(c) Variable angle of incidence.
(d) Aerofoil designs, incorporating peculiar contours and adjustable portions.
(e) A combination of any one of these with the other.

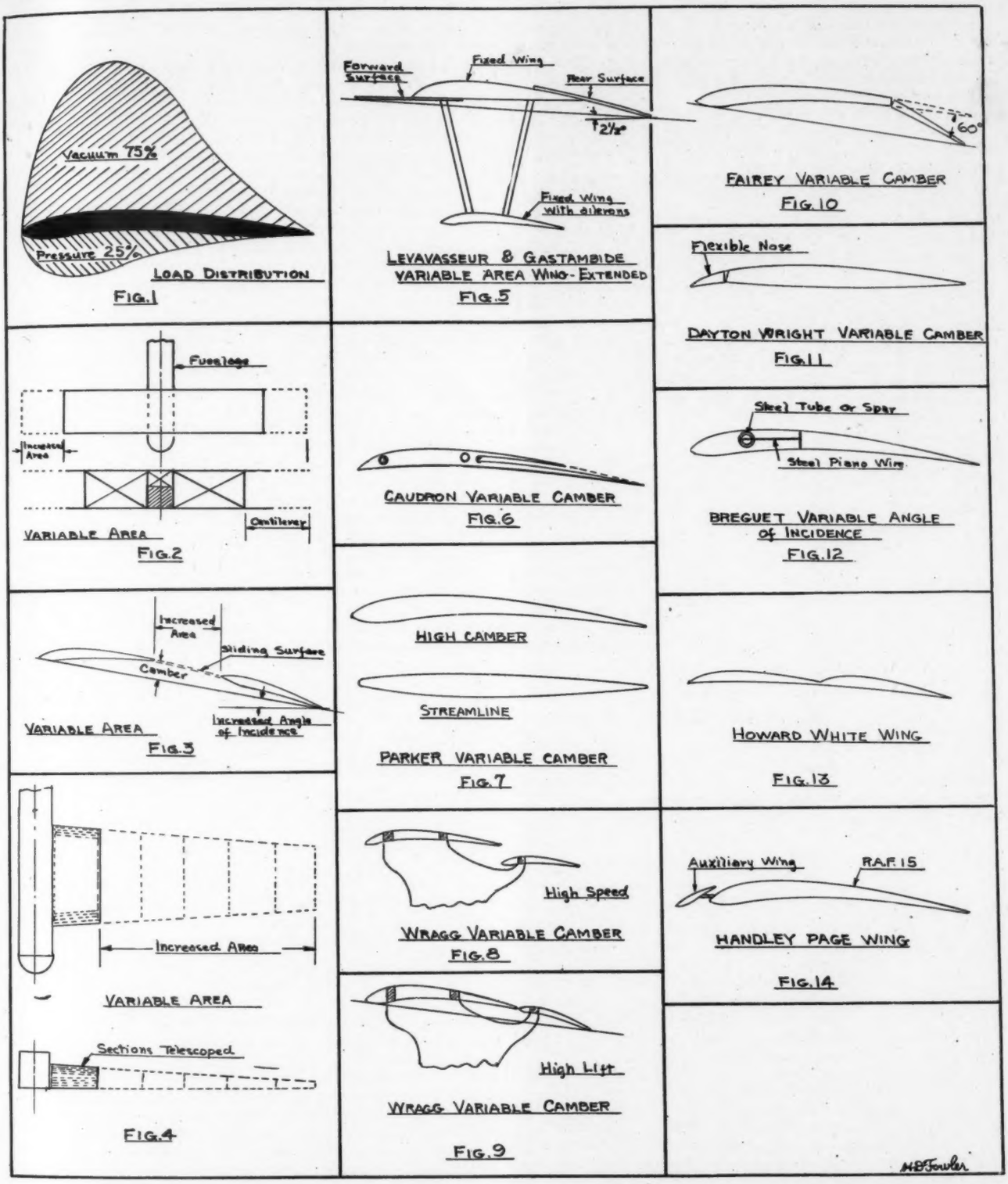
Variable Area

(a) The methods of accomplishing this are numerous, but commonly consisted of extending the span of the wing as shown in Fig. 2. The disadvantage of this scheme was that in order to obtain any appreciable increase in area the overhang would be so great as to offer high stresses in the wing beams as the result of the cantilever principle involved. The method of control was simple enough, while the increase in weight was small.

A patent was obtained recently in which two wings in tandem had a space left between them, this space to be filled in by sliding a surface coming from the rear of the front wing, Fig. 3. In doing this it had the advantage of increasing the camber and the angle of incidence simultaneously, which in addition to influencing A tends also to increase the value of K_y, provided, of course, the contour of the aerofoil when filled in was efficient. However, the tandem principle has offered but little advantage so far, and for speed purposes it did not meet the requirements.

As the result of recent investigations in thick wings a method was evolved in which the entire span was made to telescope, Fig. 4. This certainly offered an enormous possibility for increased area if the internal construction to take care of the cantilever stresses could be worked out.

The first practical demonstration of a variable area wing was made in the latter part of 1920 at Etampes, France. It was designed by Levavasseur and Gastambide, two French



aeronautical engineers. It was fitted to a tractor biplane with a 250 hp. Salmson engine. The novel feature of this design enables the pilot to vary the surface, while in flight, from 345 sq. ft. to 560 sq. ft. or a ratio of 3 to 5. The area of the bottom wing is fixed, the upper wing alone being adjustable. The latter is composed of three parts, two of which are sliding. The middle section remains fixed, the lower one slides forward, while the upper one slides backward, Fig. 5. The chord thus varies from 5 ft. 3 in. to 10 ft. 9 in. The front panel, which is flat, displaces horizontally, while the rear portion which is curved, moves backward and downward. Thus the camber varies and also the angle of incidence. When fully open, the trailing edge is 12 in. below the leading edge, and the angle of incidence has passed from 3 deg. to 5½ deg. The movement of the surfaces is made by means of cables. Its weight is 3,100 lb. fully loaded. Lift load (maximum) 9 lb. per sq. ft., (minimum) 5.5 lb. per sq. ft. Power loading 12.4 lb. per sq. ft. Maximum speed, 125 m.p.h., Landing speed, 37 m.p.h. Ceiling, 25,000 ft.

Variable Camber

(b) The variable camber may next be considered. When properly proportioned, the camber of a wing is a large factor in increasing the value of the lift coefficient K_y.

Perhaps the most simple conception of this was invented by the Caudron Bros. of France and which was successfully used by them for some years previous to the war. The wings of their airplane were flexible, the ribs of which are double surfaced for two-thirds of their chord from the leading edge, thence only the lower surface is continued on, Fig. 6. The principle being that as the speed is increased the trailing portion would flex upward and change from a cambered to a high speed wing.

Considerable experiments were made on a variable camber aerofoil invented by H. F. Parker by the National Advisory Committee for Aeronautics. It consisted of a rib that could be made to alter the contour of an aerofoil from a highly cambered to an approximate streamline form, Fig. 7. It had a maximum lift coefficient of 0.00388 and a minimum drag of 0.00035. It had excellent aerodynamic characteristics but the construction offered many difficulties.

A somewhat similar idea was proposed in a British design.

Another method was invented by C. A. Wragg in which two aerofoils were placed in tandem on a biplane as shown in Fig. 8 for high speed conditions. The forward one being larger, and slightly above the smaller aerofoil. For landing, the rear portion of the front aerofoil was deflected downward and closed in at the nose of the rear aerofoil, which was simultaneously raised, Fig. 9. The resultant contour of the aerofoil was somewhat irregular.

A very popular method of varying the camber is by means of running a flap the whole span of the wing back of the rear spar, similar to the aileron, Fig. 10. This flap could be dropped 60 deg. and the angle of incidence of the main plane 10 deg. and obtain the maximum lift coefficient 0.00408. This wing is being used on the Fairey airplanes in England, with promising results, although it is said that they had to make provisions for an adjustable stabilizer to work in conjunction with the flap movements. The tests in the wind tunnel were carried on with an R.A.F. 9 aerofoil.

A more promising wing is one in which a narrow front flap and a fairly wide rear flap are attached to the aerofoil, both being moved simultaneously so that the new chord is always parallel to the original. Tests recently made at the M.I.T. on a Glenn Martin 2-F showed a maximum K_y of 0.00516.

Considerable attention was drawn to the Dayton Wright entry in the Gordon Bennett Aviation Cup race in September, 1920. The leading edge of the monoplane operated on a flap principle, which had a limited ability of changing the aerofoil from a streamline to a cambered wing. (Fig. 11.) Its exact lift coefficient is not known.

Variable Angle of Incidence

(c) The principle of a variable angle of incidence machine was based upon the aerodynamical fact that the parasite resistance is approximately least when the fuselage is in the line of the wind. When the airplane flies at a higher angle, and the fuselage is at a greater angle to the wind, the parasite resistance increases accordingly. In the variable angle of incidence machine, the fuselage chassis are maintained in the line of the wind with a theoretical gain in efficiency.

Perhaps the first practical attempt to utilize this principle was made by Bréguet of France, and consisted of a method by which a number of ribs were attached to a steel tube by means of stiff piano wires (Fig. 12). This provided flexibility to the rib, as well as a convenient method of revolving a single spar for the purpose of changing the angle of incidence. Trials with the Bréguet machine resulted in a smash up.

Paul Schmitt, also of France, brought out an airplane in which the entire wing could be changed in angle of incidence. This machine, which was a biplane, was very popular in its day and had many successful flights.

The Lanzius machine, constructed in this country, was very similar to the Schmitt type.

New Aerofoil Sections

(d) Under this heading the field has been but little touched.

At the Fourth Olympia Show held in London in 1913 a biplane was exhibited by Howard Wright, the wing section of which may be described as one of double camber, or as one in which the leading edge of one plane is attached to the trailing edge of the other. They were of such a camber, however, that the combination of the lower surfaces of both formed a regular curve, while the upper surface had a considerable dip at the center (Fig. 13). One of the reasons for the adoption of this camber was that the movement of the center of pressure, of but 2 per cent of the chord, takes place between 0 deg. and 15 deg. The machine was designed to fly its fastest at an angle of incidence of -1 deg.

Perhaps the most novel idea of any that has been suggested is that of F. Handley Page of England, said to have also been invented in Germany by Lachman about the same time. As stated by Mr. Page, the principle utilizes the theory that the wing deflects the air through an angle so as to obtain the lifting force due to the change of momentum in the air, but it has been found by experience that a thick or highly cambered wing has a larger lift per unit surface than a less cambered or thinner wing, although the highly cambered wing has a disadvantage in that the resistance to passage through air at small angles and at small values of the lift is large. It is also known that when a wing is inclined at an angle to the air through which it passes or which acts against it, the lift coefficient of such a wing increases with the increase of its angle up to a certain critical angle which varies between 12 deg. and 25 deg. After the critical angle is passed the value of the lift coefficient of the wing decreases owing to an effect, called a "burbling," taking place over the forward portion of the upper surface of the wing. As is well known, the total reaction on an aerofoil is the sum of the positive pressure on the underside and the negative suction on the upper. If this negative suction can be made to increase progressively with increasing angle of incidence to angles greater than heretofore, the maximum value of the aerofoil lift coefficient will be increased. To obtain this, a small auxiliary wing is fitted to the nose of the main wing, and, by means of a slot arrangement can be made to extend forward (Fig. 14). In a public demonstration with this device rigidly attached on a DH-9, it took off very much quicker than another DH-9 which took off at the same time. Its angle of climb was much steeper, though slower in speed on climb. In horizontal flight its speed was not improved, and on landing it seemed to pancake, but settled down gently and stopped within a few yards. It is now reported that a monoplane is being constructed incorporating this device. It seems that the more auxiliary wings there are the higher the lift obtained. For a single slot on an R.A.F. 15, the maximum lift coefficient is increased from 0.00264 to 0.00429, an increase of 61 per cent, and the lift/drag ratio is higher with the slot open at all angles above 12 deg. Higher values have been obtained, but the aerofoil it was used with was not suitable for high speed purposes.

A specially designed wing known as the Alula was tested in an English laboratory; this is very complicated and resembles somewhat that of a bird's wing. It has a maximum K_y of 0.00408.

Combining Various Features

(e) From the above review of various methods to obtain better efficiency it is clear that much attention has been devoted to this subject. It was not possible to include all of the known devices because of the length of the descriptions, but the general attempt is following along the lines of those just described. It is apparent, however, that any method which incorporates any of these ideas into a combination will make much more substantial progress, providing the mechanical construction can be easily worked out.

Comparative Analysis

Having made this review it is desired to know to what extent their values have or will increase the lifting capacity or performance of the present day airplane. For most of these inventions it is difficult to make a comparative estimate, as little, if any, wind tunnel test data are available. However, it was possible to get together a few that have been published covering some of the latest ideas, and compared against the U.S.A. 27, the best overall efficient aerofoil so far developed. In Table I are given the aerodynamic characteristics, and in Table II the significance of their values when applied to an assumed airplane weighing 5000 lb. and capable of landing

at 50 m.p.h., also their value for high speed purposes, based on a maximum speed of 100 m.p.h.

In analyzing the relative efficiency, no allowance is made for the added weight or possible head resistance which may be inherent in the design of the device for controlling the lifting capacity of the wing, for they are all more or less subjected to this restriction. On the other hand, the ability of these devices to carry such large loads that the total area is greatly reduced from that of a rigidly constructed wing, and may lead to the entire elimination of struts and wires, and thus present a much more efficient aerofoil, aerodynamically and structurally.

Conclusion

Of any of the devices so far produced it is evident that the variable area principle offers the most promising results. While no figures are available for the Levavasseur and Gastambide aerofoil sufficient information is available as to its landing speed, while the contour of the wing when totally drawn in resembles that of the R.A.F. 6, so it was assumed that the L/D at 1/6 max. K_y was 7.5. Some criticism may be directed to this value, but it will be found that even for an L/D of 6 (corresponding to 153 lb. resistance and 41 hp.) that this form of wing still offers a marked improvement over any of the other devices considered. Another advantage of this form of variable area wing is the increased angle of incidence of 2½ deg. which means that the inclination of the fuselage is that much less when landing, and consequently offering that much less resistance, and if there is sufficient clearance of the propeller blade the landing chassis may be shortened, which in turn will facilitate landing.

For climbing, the Alula design seems to be the best with an L/D of 23.0, while for cruising speed the Handley Page is the best with an L/D of 16.6. However, this is so because of the absence of data on the variable-area wing. There is no doubt that this will be found to be a much better wing for climbing on account of its ability to utilize its large wing area, and resulting in securing a much higher absolute ceiling. Its cruising speed will be about normal, or about proportional to its high speed.

Some Minor Points

Several questions may be raised in regard to the strength and stability of a variable-area wing. From my investigations I feel safe in stating that the strength and stability need not be at all inferior to that of any present day airplane, but in fact that these qualities may be appreciably increased, especially so when flying with minimum area.

In all of the devices considered herein the question of the movement of the center of pressure was little touched upon for the reason that they all are more or less influenced by the maximum peak of the distribution of lift load along the chord in the endeavor to obtain a high lift coefficient. Compared with the variable area principle, however, it can be noted upon reference to Table I that all very high lift wings attain a high angle of incidence, especially those equipped with flaps, and therefore the movement of the center of pressure takes place through a very wide range. With the variable area this movement is somewhat less according to the amount of increased angle of incidence obtainable.

On all adjustable devices the method of control mechanism offers about an equal problem, and with due consideration for ease of movement and light weight, any of them should be possible to operate from the pilot's seat. In regard to the attention required of the pilot, however, I believe the variable area wing offers the least care of any, for the reason that his attention is required only when he desires to inclose the wing, or extend it, for the purpose of high speed, or when landing and getting off. All the other devices require a certain amount of movement for certain desired performance, such as getting off, climbing, altitude or cruising speed.

The adoption of a newly designed aerofoil which is better than formerly found represents that much more advantage when adopted to any of the devices, particularly so when applied to a variable-area wing. Its possibilty may be more appreciated when it is asserted that this form of wing design will make it possible to place an obsolete type airplane into the active list of military and commercial aircraft.

TABLE I

Combination	Aerofoil	Landing Speed max. K_y	Cruising Speed L/D max.	Climbing @2-3 max. K_y	High Speed (fast airplane) L/D@1-6 max. K_y	Maximum Angle of Incidence
Orthogonal	USA-27	.00359	16.2	13.7	7.7	16°
Variable Area Wing	Levav'ur & Gastim	.00405*	....	....	7.5‡	18°—2½°
Variable Camber	Fairey	.00408	16.4	16.2	6.0	1°+60°
	Martin-2F	.00516	15.4	9.7	12.7	12°+55°
	Parker	.00388	14.9	14.2	7.0	16°
Various Designs	Alula	.00408	22.9	23.0	3.0	18°
	Handley Page RAF-15	.00429	16.6‡	14.0‡	10.0	21°
	H. Wright	.00345	14.8	13.4	4.5	14°

* Based on biplane value, minimum speed at 37 m.p.h. and 560 sq. ft.
† Based on .00303 max. K_y of R.A.F.6
‡ Based on .00264 max. K_y of R.A.F.15

Table II

Combination	Aerofoil	Total* Area sq. ft.	Resistance† per relative area, lb.	Power required† per relative area, hp.
Orthogonal	USA-27	556	260	69.0
Variable Area Wing	Levav'ur & Gastim	493	123‡	33.0‡
Variable Camber	Fairey	490	333	89.0
	Martin-2F	387	157	40.4
	Parker	515	285	76.0
Various Designs	Alula	490	666	177.5
	Handley Page RAF-15	466	200	53.3
	H. Wright	580	440	117.0

*Based on a landing speed of 50 m.p.h. and a load of 5,000 lb.
† Based on a maximum speed of 100 m.p.h.
‡ Based on a minimum area of 304 sq. ft.

The French Anti-Aircraft Service

The following is a translation of an article on the above subject which appeared in recent issues of *Revue de l'Aéronautique Militaire:*

A temporary organization was created in 1914, but notwithstanding the efforts made, the service has always lacked the required resources and organization. The law of March, 1919, attached the Anti-Aircraft Service to the Army Air Service and authorizes, in time of peace, the following:

An Anti-Aircraft Bureau within the Air Service of the War Department; five regiments; one central establishment; one technical section; one school. The regiments have a special composition to meet the requirements of mobilization. The service must be ready to act from the moment any political tension makes its appearance and must be able to put its units in the field simultaneously with the Army and arrange for the defense of the interior.

The composition of each regiment is as follows:

One Motorized group of four batteries of 75's.

One Mobile group of four batteries of 75's mounted on platform carriages for all-round fire.

One Mixed company comprised of two Searchlight companies, one Machine Gun Company, and one mixed company from the balloon and camouflage services.

The motorized group and a part of the mixed group are used, at the time of mobilization, for the formation of anti-aircraft units for field service with the Army; and the mobile group and a part of the mixed group for the formation of reserve groups for the protection of the interior.

This organization, which at first sight seems very advantageous, has presented many difficulties in the way of command for regiments and groups and for the instruction of units and reserves. The regiments, because of the covering role which they play, have been distributed along the eastern frontier and near the two large centers of Paris and Lyon. They are at present in garrison at Paris, Lyon, Sedan, Toul and Lure.

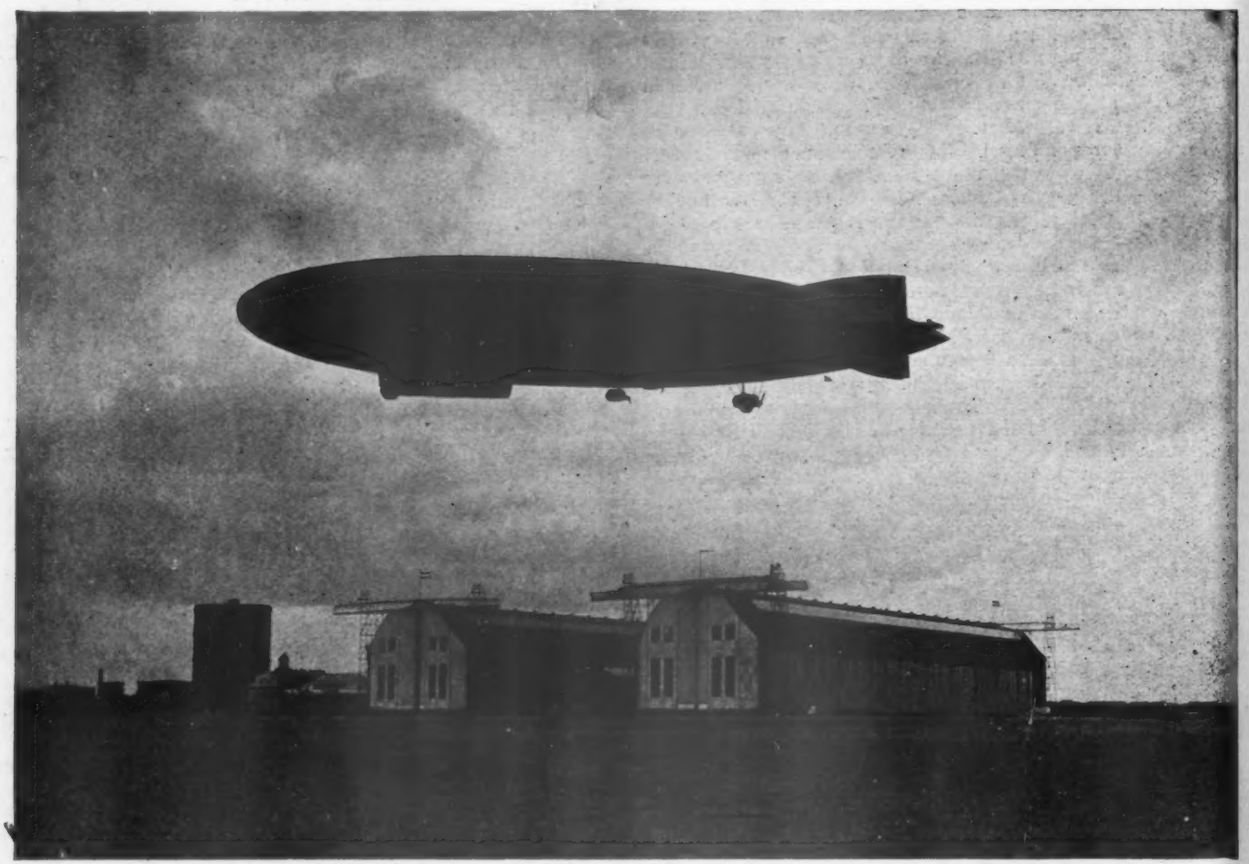
The central establishment, which is charged with administration and the greater part of repairs to material, is located at Chartres. The technical section, handling all research work, is located in the suburbs of Paris, and the anti-aircraft school is temporarily located at Montargis.—Air Service News

Spain to Argentine Airship Service

To Use Spanish Built Zeppelins of 6,300,000 cu. ft. Capacity

According to newspaper dispatches the long projected airship service between Spain and the Argentine Republic seems to have further advanced toward its realization. This scheme was originally sponsored by Major Emilio Herrera, a well known Spanish balloonist and aviator, who suggested about a year ago to organize between Cadiz and Buenos Aires a passenger and mail service by the use of nonrigid airships of the Astra-Torres type. The ships were to be built in Spain under the supervision of L. Torres Quevedo, the inventor of this type of construction, who is a Spaniard.

Nothing appears to have come of this project, but it is now announced on the authority of Hugo Eckener, director of the Zeppelin Air Navigation Co. ("Delag"), that a passenger and express service between Spain and the Argentine Republic is to be organized in the near future, using Zeppelin airships.



THE AIRSHIP STATION AT STAAKEN, NEAR BERLIN, WITH THE COMMERCIAL ZEPPELIN "BODENSEE" OVERHEAD, ABOUT TO LAND

Ships to be Built in Spain

As Germany cannot, under the terms of the peace treaty, operate civil airships until she has made good the wilful destruction, after the Armistice, of seven naval Zeppelins, it is proposed to build the airships required for this service under the supervision of German engineers in Spain and Argentina. The operating crews are to be chosen from the staff of the Zeppelin works at Friedrichshafen, and the building materials are likewise to come from Germany.

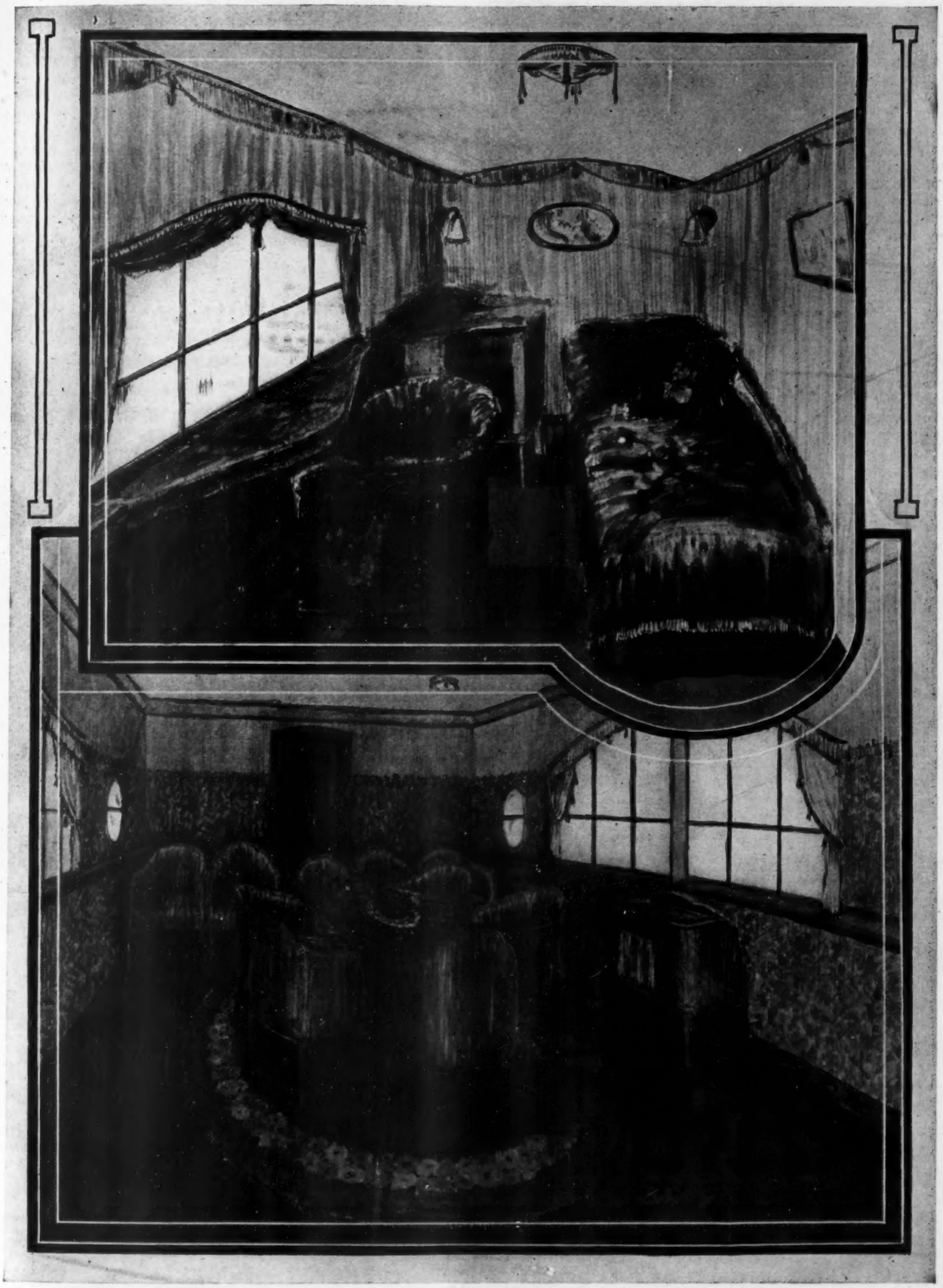
For the construction of these ships, and their operation, a Spanish syndicate is now being formed with a capital of 90 million pesetas (about $18,000,000 at nominal value). It is stated that a group of Spanish bankers and industrialists has already subscribed 50 million pesetas, and that the Spanish government will guarantee the payment of 5 per cent dividends. The intervention of the Spanish government in this enterprise is made possible by a new law which authorizes the expenditure of public funds for the furtherance of ventures possessing public utility.

Three Zeppelins are to be constructed at an approximate total cost of $7,000,000 and about $8,000,000 is to be spent on terminal facilities. The ships are to have a capacity of 6,300,000 cu. ft., an overall length of 825 ft., and a maximum diameter of 128 ft. They will develop a high speed of 90 m.p.h., and have accomodations for sixty passengers. Provision is also to be made for carrying a maximum of 300,000 postal packages and letters.

The distance between Cadiz and Buenos Aires is about 7,000 miles, and the trips are to be made in ninety hours. While the exact route the service contemplates using has not as yet been announced, it seems likely that it will run by way of the Canary and Cape Verde Islands to Pernambuco, Brazil, and thence to Buenos Aires. A possible alternate route would run by way of Casablanca, Morocco, and Dakar, French West Africa. In either case the longest oversea trip will have a length of 2,000 miles, from Africa to South America.

The European Terminal

The European terminal is to be situated between Cadiz and Sevilla, where a large hangar will be constructed, while at Buenos Aires two sheds—one revolving—will be built. It is estimated that the construction of these sheds will take about two years, although the airships can be constructed in



THE TYPE OF PASSENGER ACCOMMODATIONS PROPOSED BY THE ZEPPELIN CO. FOR ITS LARGE COMMERCIAL AIRSHIPS. THE UPPER PICTURE REPRESENTS A STATEROOM, THE LOWER PICTURE A LOUNGE

much less time. Should the line run by way of Casablanca, a third hangar would become available in the shape of a large Zeppelin shed, surrendered by Germany, which the French Air Service proposes to erect at that place. The use of this air base would of course be conditional upon some form of French participation in this scheme, and while various hints have been made in some quarters to that effect, no reliable announcement has as yet been forthcoming from France. In this connection it is however significant that the commercial airship service which is to be organized between Marseilles and Algiers, and which has the backing of the French air department, is to be run by the Compagnie du Réseau Transafricain, a firm which is known to have connections with the Zeppelin company. It is therefore possible that this company may also be connected with the projected South American Zeppelin service, so that the latter would actually work out as a French-German-Spanish combine. The dearth of capital available in Spain, and the low rate of exchange of the German currency increase the likelihood of French capital being involved in this venture. If such should be the case, the South American airship line would probably be extended to Paris, where another of the ex-German Zeppelin sheds is being erected at the newly created airship port at Orly, and perhaps even to Berlin. Regardless of possible sentimental objections, France would derive considerable profit from such a service, the more so as there already exists a considerable passenger traffic between France and South America, while on the other hand it seems almost impossible that Germany could make such a venture without French participation of some sort or the other.

State Aeronautical Legislation

In connection with the Wadsworth Bill, which Representative Hicks introduced in the House, and the address by Maj. W. J. Davis on the legality of federal air legislation, the following summary of state air legislation, prepared by the Manufacturers Aircraft Association, is of timely interest.

The desirability of federal air legislation which would provide for a uniform set of laws applicable to air navigation in all parts of the United States has repeatedly been pointed out in these columns. The large number of state air laws which are enumerated below show the urgent need of prompt Congressional action with respect to the Wadsworth Bill.

In the enumeration which follows the first figure indicates the year in which the law was passed and the second (between parenthesis) is the chapter of the law code of the state in question.

California

1919 (300). Prohibits the use of airplanes in hunting.

1921 (783). An act concerning the registration, numbering and use of aircraft and the licensing of operators thereof. In effect Aug. 2, 1921.

Connecticut

1918 (176). Provides for the registration and regulation of aircraft. In effect June 8, 1921.

1921 (207). An act concerning aircraft, (to register and issue licenses, to operate). Approved May 20, 1921.

Indiana

1921 (189) Provides penalty for the unlawful taking of aircraft. In force May 31, 1921.

1920 (48). Aviation fields. Provides for acquisition, equipment, management, operation thereof.

Kansas

1921 (264) An act creating a state aircraft board, regulating the navigation of the air by aircraft; authorizing cities to provide municipal aviation fields. Approved March 1, 1921.

1921 (16). Prohibits the use of airplanes in hunting.

Massachusetts

1919 (306). An act to regulate the use of aircraft. In effect 1913.

Michigan

1919 (82). An act to prohibit the molesting of game and insectivorous birds by operation of aircraft. April 19, 1919.

Minnesota

1921 (433). An act to regulate the traffic of aircraft over cities of the first class and prescribing penalties for the violation thereof. Approved April 23, 1921.

Montana

1921 (238). Prohibits use of airplanes in hunting.

Nebraska

1921 (165). An act to authorize cities of the metropolitan class, cities, of 1st class or cities of 2nd class to acquire lands for the purpose of establishing an aviation field and to improve the same and to provide the funds therefor by the sale of bonds of such city. Approved March 15, 1921.

New Jersey

1921 (124). An act regulating the operation of motor-driven aerial machines. Approved March 31, 1921.

New York

1919 (391-93). Insurance law now permits casualty, marine and fire insurance on "airplanes, seaplanes, dirigibles, or other aircraft."

1920 (715). An act to amend the greater New York charter, relative to ceding, granting and conveying to the United States lands and lands under water, acquired by or owned by the city of New York, necessary for the establishment of air stations in connection with or defence of New York harbor and the Atlantic coast. May 11, 1920.

North Carolina

1919 (38). Hunting wild fowls with airplanes unlawful.

Oregon

1921 (113). An act to provide for appropriation of property for air field in cities and towns. February 19, 1921.

1921 (45). An act to provide for the organization of an Oregon State Board of Aeronautics, regulating flying and registering aviators. Approved February 12, 1921.

Texas

1919 (9). Authorizing private corporations for the purpose of construction, manufacture, etc., of airplanes, Approved February 17, 1919.

Washington

1919 (48). An act relating to facilities for aerial transportation, authorizing cities and counties to acquire, maintain, and operate lands and property therefor, and declaring the same to be for country and city purpose and public use. Approved February 28, 1919.

Wisconsin

1919 (613). Provides for county landing fields.

Hawaiian Islands

1917 (107). An act prohibiting the operations of airplanes, balloons, and other aircraft in the territory of Hawaii with certain restrictions. Approved April 19, 1917.

A Message from Gabriele D'Annunzio

Gabriele D'Annunzio, Italy's Poet-Aviator, who became a figure in international politics as the result of his occupation of Fiume, has given through Maj. James E. Chaney, Air Service, Assistant Military Attaché at Rome, a message to the aviators of the United States, a translation of which is as follows:

> "While the wings of new Italy are racing over this reconsecrated lake for the Cup of the Eagles offered by me, I send across the ocean my greetings and the greetings of all Italian aviators to our glorious American companions who with us are steering the aerial prow toward the promise of the future."

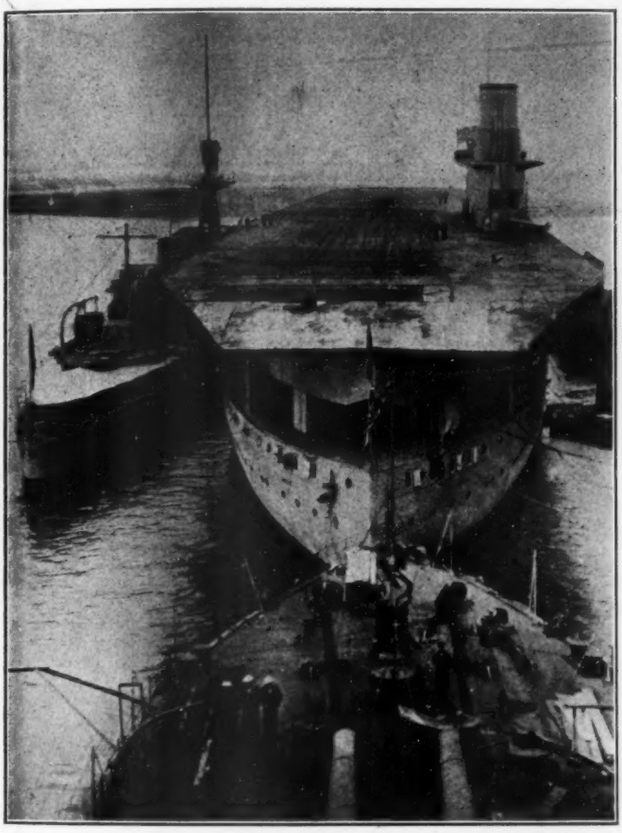
Major Chaney states that he met D'Annunzio on Sept. 25 at Lake Garda, on which day were staged the international races for the d'Annunzio Cup.

Admiral Sims on Aviation

Says Battleships Are Obsolete -- Praises Airplanes and Aircraft Carriers

The following remarks are taken from the Waterbury Republican of Nov. 28 and report a talk given in Waterbury before the Second Congregational Church Forum.

That the battleship was becoming obsolete on account of the airplane, that the airplane carrier was becoming the backbone of the navy, and that scrapping of the battleships built and planned, as proposed by the disarmament conference, would not affect the defenses of this country at all, were some



"The Great Need Now is the Construction of Airplane Carriers"—Admiral Sims

of the startling statements made by Rear-Admiral W. S. Sims at the Second Congregational church forum last night.

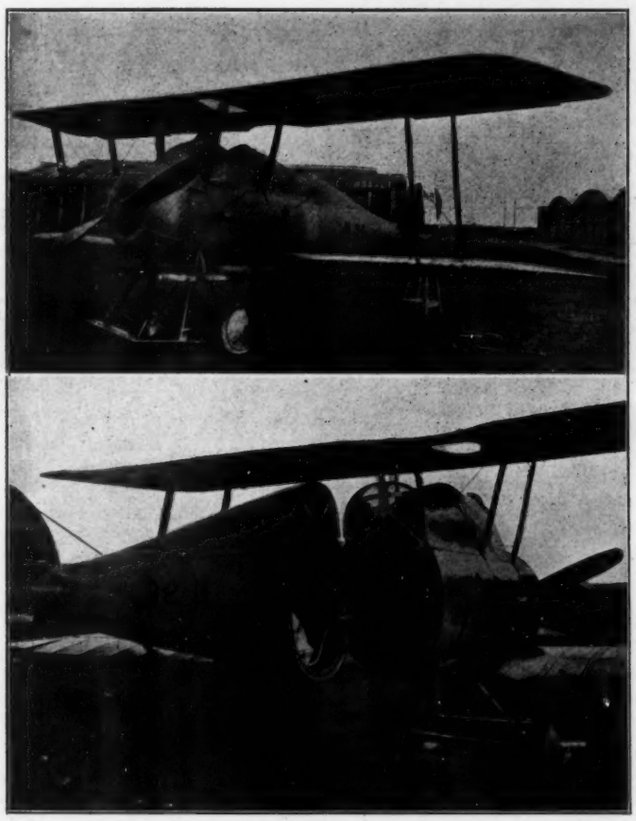
The admiral referred indirectly to the controversy caused by recent utterances when he said that he proposed to speak on the question of battleships versus airplanes, armaments, etc., "So you see," he said, "there are explosive subjects, and allow all possible chances for 'indiscretions.' "

"It has been said in the past that the battleship was the backbone of the fleet," he said, "but I believe it is no more. The battleship has no defense against an airplane but small anti-aircraft guns. At the western front it was considered that one hit in 1,000 was a good average, with massed batteries for miles firing at a plane, and plenty of observation to determine the range. The best experts now agree that the results of anti-aircraft fire from a ship are negligible.

Command of Air

"The command of the air means the command of the surface, whether it be sea or land. The experiment of sinking the Ostfriesland by airplane bombs proves that if our coast is protected by airplanes no ships can reach our shores or land troops."

The great need now is the construction of airplane carriers, he said. The latest model had an absolutely bare deck, he said, the funnels being on the sides of the ship. The deck was sufficiently wide and long to provide ample landing space. It had special elevators which carried the planes below decks. The wings of the planes could be folded up so that a large number of planes could be carried on several decks. An airplane carrier had nothing to fear from a battleship or



Two Views of the Parnall "Panther", a Shipboard Airplane of the British Navy. The Fuselage Is Made to Fold, Aft of the Cockpit, to Facilitate Stowage on Board Ship. The Landing Gear Is Fitted with Busteed Flotation Bags

Photo International

battle-cruiser, he said, as it had a speed of 35 knots—more than any battleship or cruiser—and could always keep out of the latter's range, while the airplanes it carried could destroy the battleships.

"Battleships Gone"

"There are those of us who believe," he said, "that the battleship is gone and that scrapping them doesn't cut any ice whatever. We need not worry, either, about destroying the battle cruisers now building, as they are as helpless as the battleships against airplanes."

Airplanes could be built far more rapidly and far more cheaply than ships, he said. If we spent millions on battleships and battle cruisers, and another nation spent only half as much on airplanes, he said he would have no doubt of the result.

Numerous questions were asked at the conclusion of the address. One was:

"Will the battleship become obsolete because of airplanes?"

"Yes," Admiral Sims answered.

"Who's Who in American Aeronautics"

(Copyright, 1921, by The Gardner, Moffat Co., Inc.)

Every week, AVIATION AND AIRCRAFT JOURNAL prints the biographical sketch of men who are prominent in American Aeronautics. These sketches will be published later in pamphlet form. As so many of the officers change their stations often, it is believed that a semi-annual issue will be necessary. In compilations of this character many errors and omissions occur. It will be appreciated if corrections are sent to "Who's Who" Editor.

Henry Blanchard Hersey

HERSEY, HENRY BLANCHARD, Meteorologist; born, Williamstown, Vt., July 28, 1861; son of Joel Hersey and Recta Wheelock (Blanchard) Hersey.

Educated: B.S. 1885, M.S. 1906, Norwich University; course at U. S. Signal Service Tech. School, Ft. Myer, Va.

Professional: In service of U. S. Weather Bureau, 1885 to date.

Aeronautical Activities: Executive Officer, Wellman Chicago Record-Herald Polar Expedition, 1906-1907; experienced meteorologist and balloonist, being a licensed aeronautic pilot of the Aero Club of France and of the Aero Club of America; assisted Lt. Frank P. Lahm, U. S. A., in the International Balloon Race at Paris, 1906, helping to win the James Gordon-Bennett cup; sailed the balloon "United States" in the International race at St. Louis, 1907, crossing lakes Michigan, St. Clair and Erie, and landing in Canada.

Flying Rating: Junior Military Aeronaut, July 1917.

War Service: Maj. 1st U. S. Vol. Cav. (Roosevelt's Rough Riders) during Spanish-American War; appointed Major, Aviation Section, Signal Corps, May 1917; placed in command U. S. A. Balloon School, Ft. Omaha, Nebr.; promoted to Lt. Col., Signal Corps, U. S. A., Sept. 1917; served with Balloon Division, Air Service, in France, Oct. 1918 to March 1919.

Member: Fellow, Royal Meteorology Society (London); Cosmos (Wash.); University Club (Los Angeles).

Present Occupation: U. S. Weather Bureau.

Address: U. S. Weather Bureau, Los Angeles, Calif.

Victor Clark Parker

PARKER, VICTOR CLARK, Consulting Engineer; born, Mandan, N. D., Sept. 16, 1887; son of Morris Leslie Parker and Frances (Snyder) Parker; married, Matilda Thompson, June 24, 1914.

Educated: Public and high schools; Bachelor of Science in Mechanical Engineering, 1909, North Dakota Agricultural College.

Professional: 1909-1910, Technical Editor, "Modern Power" magazine; 1911-1912, Experimental Engineer, General Motors Co., Detroit; 1913-1915, Assistant Engineer, Buick Motor Division, G.M. Co., Flint; 1915-1917, Chief Technical Division, B. M. Co.

Aeronautical Activities: 1917, Chief Engineer, Gnome Motor production, Gen. Motors Corp.; 1917, Lab. Eng. Research, Naval Aviation Lab., Washington; 1917-1918, Major, 3rd M. M. Regiment, U. S. Air Service; Chief Inspector, Air Prod. Centre No. 2, Romorantin, France; Com. Officer, Production and Maintenance Division, night bombing machines, Milan, Italy.

War Service: Major, Sig. R.C., A.S., Dec. 1917-March 1919.

Member: Society of Automotive Engineers.

Present Occupation: Consulting Engineer.

Address: 717 Kingsley Ave., Waterloo, Iowa.

Paul Elsworth Barden

BARDEN, PAUL ELSWORTH, Insurance Business; born, Wessington, S. D., May 25, 1894; son of George Barden and Emma (Greene) Barden.

Educated: Public school, Mitchell, S. D.; high school of Missoula, Mont.; 1914-1915, Oregon Agr. College; 1916-1917, Georgetown University.

Professional: 1915, Law office; Department of State, two years; Sec. of Colonial Marine Underwriters, Ltd., Montreal, Canada, 1921 to date.

Aeronautical Activities: Ground School, Berkeley, Calif., 1917; elementary flying training, Lake Charles, La., 1918; pursuit flying training, Lake Charles, La.; pursuit gunnery instruction, Arcadia, Fla.

Flying Rating: Reserve Military Aviator, May 1918.

War Service: Air Service, U. S. Army, July 1917 to Jan. 1919.

Present Occupation: Secretary of Colonial Marine Underwriters, Ltd., Montreal, Canada.

Address: Room 219, Board of Trade Bldg.; home, 223 Metcalf Ave., Montreal, Canada.

George Malcolm Stratton

STRATTON, GEORGE MALCOLM, Professor of Psychology; born, Oakland, Calif., Sept. 26, 1865; son of James T. Stratton and Cornelia A. Stratton.

Educated: Public schools of Oakland, Calif.; A.B. 1888, University of California; A.M. 1890, Yale University; Ph.D. 1896, Leipzig University.

Professional: Instructor, Philosophy, U. C., 1892-1894; Instructor of Psychology, 1896-1897; Assistant Professor, 1897-1899; Associate Professor, 1899-1904; Professor of Psychology at Johns Hopkins University, 1904-1908; University of California, 1908 to date.

Aeronautical Activities: Officer in Charge Med. Res. Lab., Psychology Section, Air Service, 1918; President, Aviation Examination Board, San Francisco, 1917-1918; Research in Aivation, San Diego, 1918.

Books: "Experimental Psychology and Culture", 1903; "Psychology of the Religious Life", 1911; "Theophrastus and the Greek Physiological Psychology before Aristotle", 1918.

Member: American Psychological Association.

Present Occupation: Professor of Psychology, University of California.

Address: Psychological Laboratory, University of California; home, 55 Canyon Road, Berkeley, Calif.

Edwin Foster Kingsbury

KINGSBURY, EDWIN FOSTER, Physicist; born, Hamilton, N. Y., Dec. 24, 1886; son of Edwin L. Kingsbury and Sarah (Foster) Kingsbury; married, Caroline Ellen Woodcock, June 29, 1912.

Educated: Public schools of Hamilton, N. Y.; Colgate Academy; B.S. 1910, Colgate University.

Professional: Physicist, United Gas Improvement Co., 1910-1918; Eastman Kodak Co., 1919-1920; Western Electric Co., 1920.

Aeronautical Activities: 1st Lieut., Photographic Section, Bureau of Aircraft Production, U. S. A., Feb. 1918 to Oct. 1918; Captain, Oct. 1918 to April 1919; Major, Air Service Reserve, May 1919.

War Service: As above.

Member: American Physical Society; Franklin Institute of Philadelphia.

Present Occupation: Physicist, Western Electric Co.

Address: 463 West St., New York City; home, 59 Beech St., Rutherford, N. J.

Hugh Neely Smith, Jr.

SMITH, HUGH NEELY, JR., Broker; born, Griffin, Ga., April 12, 1892; son of Hugh Neely Smith, Sr. and Pearl D. Smith; married, Anne W. Smith, July 25, 1918.

Educated: Public schools and college.

Professional: Cotton broker and exporter.

Aeronautical Activities: Feb. 1918, assigned to Air Service for duty;.

Flying Rating: Reserve Military Aviator, 1918.

War Service: Commissioned 1st Lieut., Infantry, Nov. 1917; discharged as Captain, Air Service, May 1919.

Present Occupation: Cotton broker and exporter.

Address: Box 238; home, 1705 Minnesota Ave., Chickasha, Okla.

Earl Pine Osborn

OSBORN, EARL PINE, Student; born, Hoosick Falls, N. Y., Jan. 24, 1899; son of Elihu H. Osborn and Sadie A. (Pine) Osborn.

Educated: Hoosick Falls High School; M.E. 1921, Rensselaer Polytechnic Institute.

Aeronautical Activities: Enlisted 1918; graduated Cornell Ground School, Sept. 1918; graduated, Aerial Observers Course, Coast Artillery School, Ft. Monroe, Va., Dec. 1918; commissioned 2nd Lieut., A.S.S.O.R.C., Dec. 1918; Aerial Observers School, Post Field, 1919.

Flying Rating: Reserve Military Aviator, May 1919; Airplane Observer, May 1921.

Present Occupation: Student.

Address: Buskirk, N. Y.

Benedict Crowell

CROWELL, BENEDICT, Mining Engineer; born, Cleveland, Ohio, Oct. 21, 1869; son of William Crowell and Mary (Benedict) Crowell; married, Julia Cobb, 1904.

Educated: St. Pauls School, Concord, N. H.; Ph.B. 1891, M.A. 1918, Yale University.

Professional: Mining Engineer, engaged in iron ore business in Cleveland, and also as builder and contractor until 1917.

War Service: Sept. 1916, appointed Major Q.M.C. and Nov. 1916, member of Kernan Board of War Department to report on Munitions of War and Arsenals; March 1917, went to Washington as associate of Frank A. Scott of General Munitions Board; June 1917, called to active service in Ordnance Department and in Aug. 1917 was transferred to Engineer Corps, Chief of Office and Purchasing Officer of Panama Canal Office, Washington; appointed Assistant Secretary of War, Nov. 1917; Aug. 1918, appointed Director of Munitions.

Books: "The Iron Ores of Lake Superior", by Crowell & Murray; "How America Went to War", written in collaboration with Capt. Robert F. Wilson.

Member: President, Aero Club of America; President, Army Ordnance Association; Cleveland Athletic Club; University Club (N. Y.); Yale Club; Metropolitan (Wash.); Army and Navy Club (Wash.); Chevy Chase Club (Wash.); American Institute of Mining and Metallurgical Engineers; Canadian Mining Institute; Cleveland Historical Society.

Present Occupation: Chairman of Board, Crowell & Little Construction Co.; President, Rosiclare Lead & Fluor-Spar Mining Co.; Partner in firm of Crowell & Murray, Mining Engineers.

Address: 3751 Prospect Ave.; home, 2187 Overlook Road, Cleveland, Ohio.

Stephen Sears Barrows

BARROWS, STEPHEN SEARS, Hardware; born, Ojai, Calif., Nov. 26, 1886; son of Frank P. Barrows and Julia Emily (Smith) Barrows.

Educated: Public schools and preparatory school of Ojai, Calif.; B.S. 1917, University of California.

Professional: Hardware merchant, 1900-1914; salesman, 1910 to date, for Sloss and Brittain, San Francisco, Calif.

Aeronautical Activities: First graduating class, School for Aerial Observers, Fort Sill, Okla., Sept. to Nov. 1917; 1st Corps, School for Aerial Observers, Amanty, France, Feb. to April 1918; 287th French Squadron, April to May 1918; 88th Aero Squadron, May 1918 to April 1919; Aerial Gunnery School, Cazaux, France; Operations Officer, 3rd Corp Air Service, Aug. 4 to Sept. 18, 1918; Operations Officer, 88th Squadron, Sept. 18 to April 1, 1919; commissioned 1st Lieut., F.A., O.R.C. and active duty, April 1919, Captain, Air Service.

Flying Rating: Aerial Obesrver, April 1918.

War Service: Nov. 1917 to Jan. 1919.

Member: Pacific Aero Club.

Address: 77-99 Beale St., care of Sloss and Brittain, San Francisco, Calif.; home, 319 Milpas St., Santa Barbara, Calif.

William Augustus Tilt

TILT, WILLIAM AUGUSTUS, Manufacturer; born, Paterson, N. J., Jan. 19, 1883; son of Albert Tilt and Adelaide E. (Raynor) Tilt.

Educated: Wilson and Kellogg School, New York City; Columbia University.

Professional: Silk manufacturing; Director of Phoenix Silk Mfg. Co., New York and General Manager of the Tilt Silk Mill, Pottsville, Pa.

Aeronautical Activities: Commanding Officer, 190th Aero Squadron at Ellington Field, Feb. to July 1918; Commanding Officer, 271st Bombing Squadron at Aberdeen Proving Grounds, July-Oct. 1918.

Flying Rating: Reserve Military Aviator, Oct. 1918.

War Service: American Ambulance Corps, Jan. 1914 (6 months), with the 1st Army of France.

Member: Columbia University Club.

Present Occupation: Silk Manufacturer.

Address: 334 Fourth Ave.; home, 17 West 49th St., New York City.

John David Stodder

STODDER, JOHN DAVID, Asst. Secretary, American Wire Fabrics Co.; born, St. Louis, Mo., Dec. 19, 1893; son of John M. Stodder and Elizabeth Martha Stodder.

Educated: McKinley High School, St. Louis, Mo.

Professional: Assistant Secretary, American Wire Fabrics Co., Oct. 1916.

Aeronautical Activities: U. S. School Military Aeronautics, Oct. 1917; training at Rich Field and Ellington Field; commissioned 2nd Lieut,. S.R.C., A.S., June 1918; 1st Lieut., S.R.C., A.S., March 1919.

Flying Rating: Reserve Military Aviator, June 1918.

War Service: As above.

Member: Aviation Club of Chicago.

Present Occupation: Assistant Secretary, American Wire Fabrics Co.

Address: 208 S. La Salle St.; home, 6330 Ingleside Ave., Chicago, Ill.

Thomas Walkup

WALKUP, THOMAS, Oil Business; born, July 24, 1871; son of Thomas Walkup and Celinda (Deitz) Walkup; married, Fairfax Proudfet, Feb. 9, 1919.

Educated: Chicago High Schools; three years, Mass. Inst. of Tech.

Professional: Banker and broker, New York City until 1912; oil business since that date, operating in Kansas, Wyoming and Montana.

Aeronautical Activities: President, Aviation Examining Board, Memphis, Tenn., Sept. 25, 1917 to Feb. 28, 1918; Columbus, Ohio S.M.A. for traning, 1918; President, St. Louis Aviation Examining Board, May 1918 to Jan. 1919; flying at Scott Field, Eberts Field and Park Field.

War Service: Commissioned Capt. A.S.S. Corp., Sept. 1917; commisioned Major, A.S.S.O. R.C., Feb. 1919.

Member: Billings Commercial Club.

Present Occupation: Oil business.

Address: Billings, Mont.; home, 350 N. Bellevue Ave., Memphis, Tenn.

Kirby Earl Torrance

TORRANCE, KIRBY EARL, Publishing Business; born, Whitman County, Wash., Jan. 7, 1893; son of William Grant Torrance and Margaret (Kirby) Torrance; married, Beatrice Mary Stone, May 21, 1918.

Educated: Public schools of Spokane, Wash.; 1917, University of Washington.

Professional: Newspaper work since 1913.

Aeronautical Activities: Entered Ground School, Feb. 4, 1918, after transferring as 1st Lieut. from the 20th Infantry, Ft. Douglas, Utah; duty at Kelly, Hicks and Post Fields.

Flying Rating: Reserve Military Aviator, June 11, 1918.

Present Occupation: Editor, American Falls Press.

Address: American Falls, Idaho.

Stephen Paine

PAINE, STEPHEN, Banking; born, Roxbury, Mass., July 30, 1897; son of Wm. A. Paine and Ruth F. (Ward) Paine; married, Priscilla Davis, Sept. 30, 1920.

Educated: Prince School, Boston, Mass.; 1920, Harvard University.

Professional: Stock and Bond business since March 1919.

Aeronautical Activities: Enlisted in U. S. Naval Air Service, April 1918; commissioned Oct. 1918; served as flying instructor until Feb. 1919.

Flying Rating: Hydroplane Certificate, Aero Club of America, No. 562, March 1919.

Member: Aero Club of Massachusetts.

Present Occupation: Stocks and Bonds, Paine, Webber & Co.

Address: 82 Devonshire St., Boston, Mass.; home, Beach Bluff, Mass.

Clarence George Andrus

ANDRUS, CLARENCE GEORGE, Aerological Meteorologist; born, Meriden, Conn., June 19, 1894; son of Frank G. Andrus and Helen A. (Smith) Andrus.

Educated: Public and high schools of Meriden, Conn.

Professional: U. S. Weather Bureau 1914-1921.

Aeronautical Activities: Aerological study with kites and pilot-balloons, 1919-1921; aide in winning balloon, National Balloon Race, 1921; aide in 3rd place balloon, International Balloon Race, 1921.

War Service: Aerologist, U. S. Naval Air Service, Ireland and England, March 1918 to March 1919.

Member: American Meteorological Society.

Present Occupation: Aerological Meteorologist.

Address: Weather Bureau, Due West, S.C.

Matt Quay Corbett

CORBETT, MATT QUAY, Engineer; born, Carnegie, Pa., Nov. 17, 1889; son of Col. John H. Corbett and Euphemia (Hope) Corbett.

Educated: Public schools of Allegheny County, Pa.; B.S. 1911, Pennsylvania State College.

Professional: Hydro-Electric Engineer.

Aeronautical Activities: Enlisted, U. S. Navy, April 1917; aviation duty at Pensacola, Section six; assigned to construction and operation school, Akron, Ohio; Student Officer, Oct. 1917; Free Balloon Pilot, Dec. 1917; Airship Pilot, Feb. 1918; Observer Balloon Pilot, May 1918; flying duty at Hampton Roads, Office of Director of Naval Aviation, Washington, 1918; assigned foreign duty to England and France; returned to U. S. on Feb. 1919; assigned to duty, Bureau of C. and R.; inactive duty, March 1919; aeronautical design work at Naval Aircraft Factory, 1920; Air Service design work, Fort Omaha, 1921; Acting Chief, Balloon and Airship Section, June 1921 to date.

Flying Rating: Naval Aviator, No. 549.

Member: Aero Club of America.

Present Occupation: Acting Chief, Balloon and Airship Section.

Address: 622 N. Main St., Dayton, Ohio; home, Carnegie, Pa.

Frank Dorwin Lackland

LACKLAND, FRANK DORWIN, Major, Air Service; born, Farquier County, Va., Sept. 13, 1884; son of Samuel Lackland and Katharine Lackland.

Educated: Public schools of Virginia and Washington, D. C.

Professional: Law Office; Army Officer since 1910.

Aeronautical Activities: Exec. Officer and Commanding Officer, Trades Division, Kelly Field, 1917-1918; Exec. Officer, School Director and C. O. of School of Aerial Gunnery, Selfridge Field, April 1918 to Jan. 1919; C.O., Langley Field, Jan. to June 1919; C.O., 166th Squadron Day Bombardment, Ellington Field and Kelly Field to Oct. 1919; C.O. Aviation Repair Depot, Montgomery, Ala., Dec. 1919 to Oct. 1920; A.S. Eng. School, Nov. 1920 to Sept. 1921; Air Officer, 8th Corps Aera since Sept. 1921.

Flying Rating: J.M.A.; Airplane Pilot.

Present Occupation: Major, Air Service.

Address: Ft. Sam Houston, Tex.

Donald P. Muse

MUSE, DONALD P., Captain, Air Service; born, Jonesboro, Ark., July 29, 1891; son of Moses P. Muse and Eliza A. Muse; married, Margaret Randolph, Feb. 4, 1917.

Educated: Public and high schools of Junction City; A.B. and B.S. 1912, Ouachita College, Arkadelphia, Ark.

Professional: Accountant and stock holder, Muse Mercantile Co., Junction City, Ark., 1913 to 1916.

Aeronautical Activities: Began flying instruction, Aug. 1917; Flying Instructor, U. S. Army Air Service, Sept. 1917 to Nov. 1918; flying incident to military duties, Nov. 1918 to date.

Flying Rating: Reserve Military Aviator, Sept. 1917; Airplane Pilot, July 1920.

Present Occupation: Captain, Air Service, U. S. Army.

Address: McCook Field, Dayton, Ohio; home, Junction City, Ark.

Elmer Lewis Taylor

TAYLOR, ELMER LEWIS, Student; born, Navarro County, Tex., Oct. 11, 1893; son of H. W. Taylor and Pearl Taylor.

Educated: B.S. 1916, B.A. 1917, East Texas Normal College; B.A. 1921, East Texas State Normal College.

Aeronautical Activities: Graduated S.M.A., Austin, Tex., Feb. 1918; Camp Dick to April 1918; Carruthers Field, Langley Field, Hicks Field, Camp Knox, April 1918 to Jan. 1919; commissioned 2nd Lieut. A.S., June 1918.

Flying Rating: Reserve Military Aviator.

Present Occupation: Student.

Address: Arlington, Tex.; home, Ira, Tex.

George Edmund Sykes

SYKES, GEORGE EDMUND, Financier; born, Rockville, Conn., June 4, 1880; son of George Sykes and Sarah A. (Fitten) Sykes; married, Bernice Deane Heath, April 6, 1904.

Educated: St. Paul's School, Concord, N. H.; Yale University.

Professional: Financier.

War Service: Major, Air Service; Engineer Officer of the South Texas District on the Staff of Col. James E. Fechet.

Member: Military order of Foreign Wars.

Present Occupation: Financier.

Address: Orchard Hill, Paicines, Calif.

Frank Benjamin Tyndall

TYNDALL, FRANK BENJAMIN, 1st Lieut., Air Service; born, Sewells Point, Fla., Sept. 28, 1894; son of Edward C. B. Tyndall and Marion (Yorkston) Tyndall.

Educated: Peacock School for Boys, Atlanta, Ga.; Valparaiso University, Valparaiso, Ind.

Professional: Co. L., 2nd Fla. Infantry, Federal Service on Mexican Border, June 1916 to March 1917.

Aeronautical Activities: S.M.A., Georgia Tech., 1917; primary training at Chateauroux, France, Dec. 1917 to March 1918; commissioned 1st Lieut., April 1918; advanced training at Issoudun; School of Aerial Gunnery at Cazaux, France; 49th Aero Squadron, 2nd Pursuit Group, Aug. 1918; Flight Commander, 22nd Aero Squadron, 2nd Pursuit Group, Oct. 1918 to April 1919; promoted to Captain, March 1919; Operations Officer, 1st Pursuit Group, Oct. 1919 to Jan. 1920; Operations Officer, 1st Wing, Aug. 1920 to Oct. 1920; Engineering School, McCook Field, Nov. 1920 to Aug. 1921.

Flying Rating: Brevet Militaire, March 1918; Pursuit Pilot, July 1918.

War Service: Army, May 1917 to Armistice; Toul Defense, St. Mihiel, Meuse-Argonne Offensives.

War Honors: Four official victories; citation from General Pershing.

Member: Aero Club of America; University Club (Seattle, Wash.).

Present Occupation: 1st Lieut., Air Service.

Address: Boeing Airplane Co., Seattle, Wash.; home, P. O. Box 117, West Palm Beach, Fla.

Joseph Garfield Bastow

BASTOW, JOSEPH GARFIELD, Agriculturist; born, College, Utah, Aug. 14, 1892; son of Joseph Bastow and Dortha (Christensen) Bastow; married, Irene Ricks, May 1, 1918.

Educated: Public schools of St. Charles, Idaho; Brigham Young College; B.S. 1921, Utah Agricultural College.

Professional: Secretary and Treasurer of Cache County Farmers Equity, 1919-1921.

Aeronautical Activities: Cadet training at Call Field, Dec. 1917 to April 1918; Post Field, May 1918; Pilot for Aerial Observers Training School; Taliaferro Field, June and July 1918; Gunnery School, Issoudun, France, Sept. 1918; Flying School; at the front with 1st Aero Squadron; Germany, Nov. 1918 to June 1919.

Flying Rating: Reserve Military Aviator, April 1918.

War Service: U. S. Army, Sept. 1917 to July 1919.

Present Occupation: Secretary and Treasurer, Cache County Farmers Equity.

Address: 124 South Main St.; home, River Heights, Logan, Utah.

Guy Vernon Head

HEAD, GUY VERNON, Attorney at Law; born, Matthewson, Okla., Jan. 2, 1893; son of Thomas Jacob Head and Polly (Morrison) Head; married, Mabel Louise Hurst, Aug. 16, 1917.

Educated: Public schools of Colorado Springs, Colo. and West Plains, Mo.; A.B. 1914, University of Missouri; LL.B. 1917, Harvard Law School.

Professional: Attorney, Kansas City, Mo. since March 1919.

Aeronautical Activities: On flying status, June 1918; flew at Brooks Field and Love Field from June 1918 to Feb. 1919.

Flying Rating: Reserve Military Aviator, Oct. 1918.

War Service: 1st R.O.T.C., Fort Riley, Kans.; commissioned Captain, Infantry; transferred to Aviation Section, Signal Reserve Corps, March 1918; commissioned Major, Air Service Reserve, May 1919.

Present Occupation: Attorney at Law.

Address: 303 Fidelity Trust Bldg.; home, 2721 Grove St., Kansas City, Mo.

Harold M. Hunter

HUNTER, HAROLD M., Engineer; born, Fulton, N. Y., June 28, 1892; son of James C. Hunter and Martha E. Hunter.

Educated: Fulton High School; Andover Academy, Andover, Mass.; B.S. 1914, Yale Sheffield Scientific School.

Professional: 1914-1916, Manager, Viking Mfg. Co.; 1916-1917, Assistant Manager, Hunter Fan & Motor Co.; 1919-1921, Engineering work, Goodyear Tire & Rubber Co.

Aeronautical Activities: Cornell Ground School, Camp Dick, Taylor Field, Ellington Field, Oct. 1917 to Feb. 1919.

Flying Rating: Reserve Military Aviator.

War Service: Oct. 1917 to Feb. 1919, U. S. Army.

Present Occupation: Engineering work, Goodyear Tire & Rubber Co.

Address: 408 Pioneer St., Cincinnati, Ohio; home, 254 S. Fourth St., Fulton, N. Y.

First Demonstration of the Alula Wing

The long awaited demonstration of the Alula wing, for which considerable advantages were claimed by its sponsors, recently took place at Northolt airdrome, England.

It may be recalled that the Alula wing is the invention of a Hollander, Mr. Holle. The chief feature of this wing is its shape and section, bird-like in appearance, which it is claimed directs the air flow across the wing in a uniform direction parallel to the line of flight. By thus directing the flow of air it is alleged that the Alula wing prevents the "marginal" or end losses which occur in rectangular wings through the spilling of the air at the wing tips. Mr. Holle, the designer of the wing, described it as having "two-dimensional air flow."

In view of these supposed features the Alula wing was deemed particularly desirable for use on an economical freight carrier, and a firm, the Commercial Aeroplane Wing Syndicate, was formed some time ago in England to exploit these possibilities. This company prepared drawings of a "3-ton aerial lorry," which was mentioned at the time in AVIATION AND AIRCRAFT JOURNAL, but nothing further was heard from it.

The demonstration to which we are referring was carried out with the Martinsyde Semi-Quaver fitted with an Alula wing, to test the possibilities of this arrangement for use on pursuit airplanes. The machine was identical with the one which won the Aerial Derby, being powered with a 300 hp. Hispano-Suiza engine, but the track of the landing gear was widened from 3 ft. 6 in. to 6 ft. The wing itself, being 28 ft. 6 in. in span, with an area of 106 sq. ft., is entirely built up of wood in the form of a cantilever. The surfacing is of single ply mahogany, and this is built like the skin of a boat onto internal ribs with stretcher pieces between them along the transverse axis of the wing. There are no spars to this construction, the whole wing being deemed to act as a spar, from which it follows that in flight the lower surface of the wings takes the flying load in tension. The wing, which is built in one piece, is mounted on the fuselage by means of a cabane without any internal bracing.

According to *The Aeroplane*, "Mr. Kenworthy, the pilot took the machine off skilfully in about the same distance as that required by most of the racing machines seen in the Aerial Derby and the Deutsch contests. An aged Bristol Fighter started at the same time in order to afford the spectators some gauge of the speed and climb of the Alula.

"It was arranged that Mr. Kenworthy should fire a Very light on reaching 3000 ft. The light appeared in a time stated to be 72 sec., which does not prove much, for nothing was known about corrections of the altimeter, nor about the personal equation which makes so much difference when manual timing of any sort is used.

"It was evident that the machine climbed fast, as compared with the Bristol, which carried two people on its 275 hp. Rolls-Royce "Falcon." But, as Captain Sayers (technical editor of *The Aeroplane*. EDITOR.) remarked, it was merely a demonstration of the difference between climbing with a load of 6 lb. per hp. and with 12 lb. per hp.

"After reaching 3000 ft. Mr. Kenworthy flew around for some time, doing a few rather steeply banked turns with the engine throttled down. One noticed, however, that he made no abrupt movements, nor did he run his engine all out for more than a very short period. In fact it was evident that he was treating the machine with more respect for his own safety than for the calculations on which its construction was based.

"Ultimately Mr. Kenworthy made a careful and skilful landing, after a long and gentle descent to a well judged position. The speed of landing was not abnormally high for a racing machine, though it was higher than Mr. James' habitual landings on the "Bamel," and very much higher than could possibly be accepted for any standard "aircraft destroyer" for use by ordinary pilots of the R.A.F.."

THE "ALULA" MONOPLANE WHICH RECENTLY MADE A DEMONSTRATION AT NORTHOLT, ENGLAND
Photo International

French Aircraft Engine Competition

The French Committee for Aerial Propoganda is offering one million francs for the best aero engine, which has given proof, in passing satisfactory tests instituted for the purpose, of durability, reliability, ease of dismantling and erecting, and similar qualities indispensable in a commercial engine.

The competition is to be international, under the reservations of the present rules of the Fédération Aéronautique Internationale, and foreign manufacturers will be allowed to compete after having undertaken to manufacture their engine in France, if successful. The engines must be ready for test at the latest on June 1, 1923.

The offer appears to be sufficiently generous to make it worth while for manufacturers to compete. Even at the present rate of exchange, the prize should be sufficient to see a firm just about reimbursed for its outlay in producing an engine. It should also be borne in mind that a firm which produces an engine for the competition, even if not actually winning it, would stand a very good chance of selling a fair number, since it is scarcely likely that any one engine can be found which will satisfy.

Aviation Policy of the American Legion

RESOLUTION ADOPTED AT CONVENTION IN KANSAS CITY

Whereas aeronautics have occupied the attention of the American Legion since its first meeting;

Whereas it is the sense of this convention that national aeronautics are becoming increasingly important to the Nation at large, both by reasons of national defense and transportation; and

Whereas the American Legion has twice before, viz, in its first and second annual conventions, adopted resolutions indorsing a proposed separate department of aeronautics in the National Government; and

Whereas it is now apparent, because of the increased development of civilian aerial transport as apart from the various bureaus of the Federal Government now dealing with aeronautics, that it is incumbent upon the National Government to provide for the regulation of this civilian transport and maintain the proper supervision over civilian aerial activities, chiefly because these civilian aerial activities are by nature an integral unit of the national defense, meaning reserve aviation; and

Whereas it is apparent that the heads of the Federal Government, chiefs of all bureaus dealing with aviation, the civilian organizations and clubs are unanimous in their support of a proposed law, viz, Senate bill No. 2448—introduced in the Senate of the United States August 22, 1921—creating a bureau of civilian aeronautics in the Department of Commerce to encourage and regulate the operation of civilian aircraft in interstate and foreign commerce, and for other purposes: Therefore be it

Resolved, That the American Legion, in convention assembled, recommends the early and favorable consideration on the part of both Houses of Congress of the above-mentioned bill; be it further

Resolved, That the national legislative committee be instructed to urge such immediate action in Congress as upon investigation it may deem advisable; be it further

Resolved, That copies of this resolution be prepared and forwarded to the Clerks of the United States Senate and House of Representatives, respectively, and to the Secretary of Commerce.

THE CONTEST COMMITTEE of the AERO CLUB OF AMERICA

Requests all owners (individuals or companies) of aircraft in the United States to register in order that the Committee may

1. Send, gratis, the Aero Club's Contest Rules for 1922, and notices of proposed aviation meets.
2. Assist local Clubs in organizing contests best adapted to the types of airplanes in their locality.
3. Have a record of airplanes and pilots available throughout the country in times of emergency.

USE THIS FORM.

CONTEST COMMITTEE, AERO CLUB OF AMERICA;
11 East 38th Street, New York City

Date .....

I / We) have ..... (Give number) (Airplanes) (Seaplanes) (Flying Boats) (Airships) (Free Balloons)

Make and Model .....

Motor, Make and Model .....

Maximum speed of .....m.p.h.

Capable of continuous flights of ..... miles

Cubic capacity of gas bag ..... cu. ft.

Underwriters' Laboratories Aircraft Registration No. .....

Pilot's name .....

Address .....

Owner's name .....

Address .....

Foreign Aeronautical News

China

An official Chinese circular has been issued regarding the Peking-Tsinan aerial postal service which was inaugurated on July 1 and not Aug. 1, as was officially stated previously. Regulations governing the carriage of mails or parcels are briefly as follows:

1. The Peking-Tsinan aerial postal service will carry mails and valuables. No passengers will be carried for the time being.
2. The service from Peking to Tsinan will be on Wednesdays, Fridays and Sundays, while from Tsinan to Peking the service will be on Tuesdays, Thursdays and Saturdays.
3. Machines will leave Peking on the scheduled days at 5 p. m., while they will start on their return trip at 10:30 a. m. The journey will be covered in two and a half hours.
4. The Peking terminal station will be Nanyuan temporarily, and that at Tsinan will be near Tuan Tin, Tsinan.
5. Besides the regular postage, mail or parcels carried by the service will pay aerial postage, the amount of which will be announced by the Chinese Post Office.
6. Aerial stamps will be on sale at all Post Offices.
7. Ordinary mails and parcels will be received at all Post Offices, but valuables must be taken for transportation to the preparation bureau of the Pekin-Shanghai aerial service administration, Peking, or either the Peking or Tsinan Aerodrome.

Denmark

Denmark is engaged in completing a system of conventions regulating air traffic. An agreement with Norway was recently signed, and a conference between Danish and German delegates will begin at Copenhagen for the conclusion of a convention similar to that between Great Britain and Denmark. These arrangements will prove useful when aerial intercourse, which is at present quiescent, comes to be restarted, as it will then be no longer necessary for airmen to obtain a special permit to land on every occasion, as is now the case. Conventions on the same lines with Sweden and Finland are also being prepared.

Egypt

An air mail service between Cairo and Baghdad has recently been inaugurated by the British Royal Air Force in the Middle East. This service will run fortnightly, R.A.F. pilots and machines being employed to carry official mails. The scheme is arranged as part of the regular training of the R.A.F. The whole length of the line is 840 miles, the route from Cairo being via Ramleh, Amman and Ramadie to Baghdad. A saving of ten to fourteen days will normally be effected by this service.

Holland

The airplane service between Amsterdam and German cities has been discontinued Oct. 1 until next spring. The service between Amsterdam and Paris and Amsterdam and London, which last year was discontinued from autumn to spring, will be continued without interruption through the winter. Apparently the service between Amsterdam and London, which is operated by a Dutch Company, is not financially profitable, as The Netherlands government grants it a considerable annual subsidy toward making up its deficit. The government estimate for the year 1922 makes the amount of this subsidy Fl. 370,000 ($149,740 at the normal rate of exchange.)

Sweden

Reports from Sweden indicate that it is intended to hold an Aero Show in Goteborg, Sweden, in 1923. The time tentatively fixed for the Exhibition is July 7-31, 1922. It is stated that the Society of British Aircraft Constructors and the Chambre Syndicale des Industries Aeronautiques (France) have been approached on the subject of participation in the Exhibition and have given favorable replies. It is also hoped that Italy, Germany, Czecho-Slovakia and the United States will participate.

Where to Fly

CALIFORNIA
SAN FRANCISCO, CALIFORNIA
EARL P. COOPER AIRPLANE & MOTOR CO.

ILLINOIS
CHECKERBOARD AIRPLANE SERVICE
FOREST PARK, ILLINOIS

INDIANA
One of the largest and best equipped flying fields in the United States.
CURTISS-INDIANA COMPANY
Kokomo, Indiana
ALL TYPES OF CURTISS PLANES.

MASSACHUSETTS
BOSTON AND SPRINGFIELD, MASS.
EASTERN AIRCRAFT CORP.
340 FIRST ST., BOSTON, MASS.

MINNESOTA
WHITE BEAR LAKE, MINN.
The Twin Cities' chief summer resort.
Harold G. Peterson Aircraft Company
SCHOOL OF AVIATION

NEW JERSEY NEW YORK AIR TERMINAL
800 Acres — 6 miles from Times Square.
Learn on ships that cannot tail spin. Planes rented $30. hr.
CHAMBERLIN AIRCRAFT
Instruction Div. — 3609 Broadway, N. Y. City.

NEW YORK & NEW JERSEY
CURTISS FIELD, GARDEN CITY, LONG ISLAND
KENILWORTH FIELD, BUFEALO, N. Y.
FLYING STATION, ATLANTIC CITY, N. J.
CURTISS AEROPLANE & MOTOR CORPORATION

NEW YORK
AEROMARINE AIRWAYS, INC.
Times Building, New York
11 Passenger Flying Cruisers -- 5 passenger, open and enclosed Flying Boats. Sightseeing Tours - Flights to Shore and Lake Resorts

OHIO
DAYTON, OHIO.
Supplies, Hangars, Shops and Field 1 Mile from Dayton limits.
JOHNSON AIRPLANE & SUPPLY CO.

OREGON
LAND OR WATER FLYING
OREGON, WASHINGTON AND IDAHO AIRPLANE COMPANY
PORTLAND, OREGON

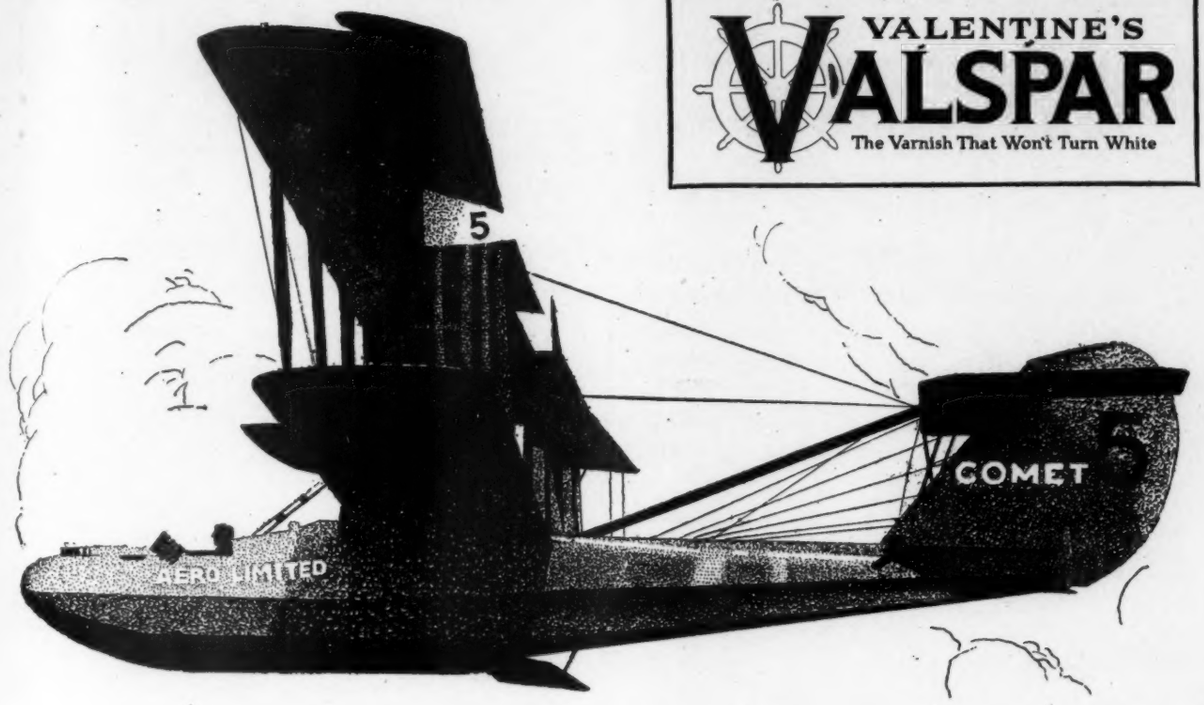
PENNSYLVANIA
Flying School and Commercial Aviation
Send for Circular
Official Flying field Aero Club of Pennsylvania
PHILADELPHIA AERO-SERVICE CORPORATION
636 Real Estate Trust Building, Philadelphia.

WISCONSIN
CURTISS-WISCONSIN AEROPLANE CO.
FLYING SCHOOL
Milwaukee Air Port
GILLES E. MEISENHEIMER
330 Clinton Street Milwaukee, Wis.

If you are one of the companies in your state having first class facilities for passenger carrying, pilots' training and special flights, you should be represented in WHERE TO FLY each week.

26 Consecutive Insertions $20.00

VALENTINE'S
VALSPAR
The Varnish That Won't Turn White



Submerged, four months—

FLYING down from New York to Miami last December, the Aero-Limited Company's hydroplane "Comet" developed motor trouble off Chincoteague, Va. The motor was removed and sent to Miami--the plane left anchored in Chincoteague Harbor.

It was not until May 18th that the Company learned the "Comet" had sunk sometime in January, and save for the upper wing, had remained submerged since that time.

The ship was raised and an unsuspected leak in a vent tube stopped. As soon as the new motor was installed, the plane was flown to Flushing Bay, Long Island, without further repairs or even re-varnishing. For careful inspection showed that despite the four months' submergence in salt water, *the wings were still absolutely taut, the hull in perfect condition--the varnish unaffected.*

Astonishing? Not when you remember that "Comet," like all "Aero-Limited" planes, was

Valsparred, of course!

VALENTINE & COMPANY
Largest Manufacturers of High-Grade Varnishes in the World—Estab. 1832
New York Chicago Boston Toronto London Paris Amsterdam
W. P. FULLER & Co., Pacific Coast

"The Bombs Heard 'Round the World"

When, to the amazement of the majority of observers on the transport Henderson, *the ex-German battleship Ostfriesland sank in fourteen minutes from the effect of two 2,000 pound Army aircraft bombs*, the doom of navies was not sealed, but aircraft as a third arm of national defense received the world-wide recognition which until then had been denied. *This fact will have tremendous influence upon development of the aircraft industry.*

IT WILL PAY YOU TO KEEP CLOSELY IN TOUCH WITH THESE DEVELOPMENTS AND COMPLETE TECHNICAL DETAILS BY READING EACH WEEK THE RECOGNIZED AMERICAN AUTHORITY ON AERONAUTICS –

Sign the coupon now but do not send any money with it. We will send you the next two issues as they appear and bill you for a year's or six month's subscription, as you prefer. If, upon receipt of bill, you decide not to continue, advise us promptly and accept the two issues with our compliments.

Aviation and Aircraft Journal

GARDNER, MOFFAT CO., INC.,
225 Fourth Ave., New York.

Send me the next two weekly issues of AVIATION AND AIRCRAFT JOURNAL. If, upon receipt of bill for subscription as indicated below, I decide not to continue, I will so advise you, and understand that no charge will be made for the two copies.

One Year (52 issues – U. S. $4.00; Canada $5.00; Foreign $6.00)
Six Mos. (26 issues – U. S. $2.00; Canada $2.50; Foreign $3.00)

Name .....

Address .....

.....

AIR LAIRD PLANES WICHITA KANSAS

The Laird Swallow

"America's First Commercial Airplane"

THE Swallow's carrying capacity--three passengers, baggage and full fuel load--is one of the reasons that it is fast becoming America's most popular commercial ship. Speedy, dependable and economical. Let us send you our booklet.

-- Now Priced at $4,500 --

E. M. LAIRD COMPANY
MANUFACTURERS
WICHITA, KANSAS
General Sales Offices
2216 SO. MICHIGAN AVE., CHICAGO.

E. M. Laird Co,,
2216 So. Michigan Ave., Chicago, Ill,
Please send me details of your new sales plan and copy of booklet.
Name .....
Address .....
AV .....

EDWARD P. WARNER

Consulting Aeronautical Engineer

Mass. Institute of Tcchnology
Cambridge, Mass.

The Spark Plug That Cleans Itself

B. G.

Contractors to the U. S. Army Air Service & the U. S. Navy

THE B. G. CORPORATION
33 GOLD STREET
NEW YORK CITY U. S. A.

FOR SALE

Cellulose Acetate Dope, quality guaranteed, 50 gal. bbls. $1.00 gal. gal. lots $2.00 gal.

MAX TOPPER & ROSENTHAL
E. 11th. AVE. & P. R. R. TRACKS
COLUMBUS, OHIO

SAFETY FIRST
AIRPLANE CLOTH
Pinked Tape — All Widths
TESTED AND GUARANTEED
To Grade A Specification 16,004
Immediate Delivery
W. HARRIS THURSTON & CO., INC.
116 Franklin St. New York
Telephone Franklin 1234
Contractors to U. S. Army and Navy

Flottorp Manufacturing Co.
AIRCRAFT PROPELLERS
Established 1912

213 Lyon St., Grand Rapids, Michigan
Contractors to United States Government

HAMILTON PROPELLERS
HAMILTON AERO MFG. CO.
MILWAUKEE, WIS.

ROEBLING
Aircraft Wire, Strand and Cord
Thimbles and Ferrules
JOHN A. ROEBLING'S SONS CO.
TRENTON, N. J.

Just A Few More Left
Aeronautical Engineering and Airplane Design
By LIEUTENANT ALEXANDER KLEMIN
Air Service, Aircraft Production, U. S. A., in Charge Aeronautical Research Department, Airplane Engineering Department. Until entering military service in the Department of Aeronautics, Massachusetts Institute of Technology, and Technical Editor of AVIATION AND AERONAUTICAL ENGINEERING. In two parts.

Part 1. Aerodynamical Theory and Data
Modern Aerodynamical Laboratories
Elements of Aerodynamical Theory
Sustention and Resistance of Wing Surfaces
Comparison of Standard Wing Sections
Variations in Profile and Plan Form of Wing Sections
Study of Pressure Distribution
Biplane Combinations
Triplane Combinations—Uses of Negative Tail Surfaces
Resistance of Various Airplane Parts
Resistance and Comparative Merits of Airplane Struts
Resistance and Performance
Resistance Computations—Preliminary Wing Selections

Part 2. Airplane Design
Classification of Main Data for Modern Airplanes; Unarmed Land Reconnaissance Machines; Land Training Machines
Land Pursuit Machine; Land Gun-Carrying Machine; Twin-Engined All-round Machine
Estimate of Weight Distribution
Engine and Radiator Data
Materials in Airplane Construction
Worst Dynamic Loads; Factors of Safety
Preliminary Design of Secondary Training Machine
General Principles of Chassis Design
Type Sketches of Secondary Training Machine—General Principles of Body Design
Wing Structure Analysis for Biplanes
Notes on Aerial Propellers

Price, Postpaid, in the United States, $5.00 Net
THE GARDNER, MOFFAT COMPANY, Inc., Publishers
225 Fourth Ave., New York City